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ANTHROPOLOGICAL INSTITUTE

OF

GREAT BRITAIN AND IRELAND.

FEBRUARY 21ST, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The following elections were announced:—

GEORGE HANDEL HASWELL, Esq., of Cornwall Works, Birmingham.

HERBERT RIGG, Esq., of 12, Stanhope Place, Hyde Park.

HUGH CLIFFORD, Esq., of Pehang, Malay Peninsula.

The presents that had been received were announced, and thanks voted to the respective donors.

Dr. J. G. GARSON exhibited an improved Travellers' Box of Anthropometric Instruments.

A paper by Lieut. BOYLE T. SOMERVILLE, R.N., entitled "Ethnological Notes on the New Hebrides," was read.

Sir HENRY HOWORTH, Mr. S. H. RAY, Mr. A. L. LEWIS, Mr. J. EDGE PARTINGTON, and Dr. J. G. GARSON joined in the discussion.

A paper by Mr. E. H. MAN on "Nicobar Pottery" was read.

Mr. C. H. READ, Dr. J. G. GARSON, and Sir HENRY HOWORTH took part in the discussion.

NOTES *on some* ISLANDS *of the* NEW HEBRIDES.

By Lieutenant BOYLE T. SOMERVILLE, R.N.

[WITH PLATES I., II.]

THE New Hebrides group of islands, lying about 2,000 miles to the eastward of Northern Australia, are at present but slightly known either to the navigator or to the scientific investigator.

Discovered by Captain Cook in the latter part of the last century, and only visited at intervals since then by kidnappers, sandalwood cutters, bêche-de-mer fishers, and latterly by "labour vessels" and traders, it is scarcely surprising that the existing surveys of these islands are of the most sketchy description, and the information concerning their inhabitants a record of blood and evil deeds.

Owing therefore to the great uncertainty of their position, and the increasing traffic during recent years, both of men-of-war and merchant vessels, it was at length decided to make a systematic marine survey; and to this end H.M.S. "Dart" was dispatched, in June, 1890, to begin operations there at the island of Efate. During the surveying seasons—June to December—of 1890 and 1891 in these parts while serving in the "Dart," I made a few notes concerning the peoples of the islands we visited; but I am largely indebted to Mr. Macdonald, of Havannah Harbour, Efate; to Mr. Michelsen, of Tongoa Island; and to Mr. Gillan, of Uripiv Island, off the coast of Malekula Island—all Presbyterian missionaries, the two former resident on now Christian islands, and the latter on an absolutely heathen one—for much of what hereafter appears.

Their intimate knowledge of the natives, and especially of their languages, renders them entirely reliable sources of information concerning these Oceanians, both in their savage and civilized conditions.

It should be borne in mind, however, that the habits of the natives of close-lying islands sometimes vary extraordinarily; so I must premise that all my notes refer to quite a small portion of the group—namely, Efate Island, the Shepherd Islands, and the east coast of Malekula. Outside these limits I cannot give any information; but will only mention that my account of "Narak" in the island of Tanna—some miles south of our field of work—was taken almost at word of mouth from Rev. W. Gray, the missionary resident at Weasisi, on the occasion of our visit there in 1890, bound to Sydney.

Let me, then, without further preface, begin by describing, as far as I can, the rules of society which still obtain in the non-Christian parts.

Social Customs.

In considering the social customs of the islands we visited, it should be remarked that the Christian natives have absolutely and violently changed their old habits of life. They who were once dirty, naked, licentious, polygamous cannibals are now quite the reverse, and very earnest believers in the Christian religion besides. Beyond the general condemnation stated above, I am unable to say what their various peculiarities were; I glean, however, the following from Mr. Macdonald's book "Oceania," with regard to his converts of Efate, on the subject of family relationship and degrees of affinity, which still exist in a modified form. I have reason to believe that the same customs are found in all the islands we visited, but have obtained no certain knowledge on this point.

When a man desires to marry—a mere payment of pigs for a woman—his wife is invariably chosen from another tribe. Their children belong to this, the *mother's*, tribe, and consequently the father does not take the same interest in them that, as we think, he naturally should, but rather devotes himself to his sister's children—(who, of course, are, therefore, his own tribesmen)—on whom, if he has any property to leave at his death, he bestows it, his own children being looked after by *their* uncle; thus matters right themselves, however unnatural it may seem. This is, of course, the result of polygamy, and, in such a condition of life, one can imagine it being very convenient.

It has also been supposed to exist on the score of polyandry; or, perhaps on account of looseness of life on the part of the wives, where the paternity of the children became doubtful. In the first case, however, there is no record of polyandry having ever been practised; indeed it would be looked on in the present day with repugnance; and in the second, considering the extraordinary jealousy of husbands (in the islands we visited, at all events)—and the vendetta that invariably follows an adulterer to his death—this theory seems to me a mistaken one.

A child calls all his uncles on both sides, "father"; all his aunts, "mother"; and his first cousins, "brother" or "sister"; in fact, one rarely hears one person call another by his given name; and often the ridiculous sight may be seen of a man calling a small girl, much younger than himself, "mother." This makes it necessary to enquire who a man's *real* father or mother is.

Thus, at the beginning of things, the members of a tribe—all by name "brothers" and "sisters," children of the originating mother of the tribe—were considered so nearly related, that marriage within tribal limits came to be looked upon as incest, and to be punished with death. This idea still obtains; although the reason for it has, of course, become lost: and no doubt it has been very beneficial to the health and vigour of the various races, by preventing close intermarriages.

We may now leave Efate and visit heathenry in the small but populous islet of Uripiv, lying off the north end of Malekula: for the greater part of the following information concerning it Mr. Gillan, missionary at that place, is responsible.

The most noticeable features of domestic life here will be found in the curious segregation of sexes, and the superstitious dread of eating anything female. Women are degraded to the level of brute beasts, doing all the hard field work, and being made to carry loads which appear quite disproportionate to their ugly-shaped bodies and thin legs.

Let us follow an Uripiv man from cradle to grave, and see how these savages live their life.

A few days after birth a killing of pigs takes place, and the child is, as we would say in the Navy, "rated a man." Henceforward he must cook his own meals at his own fire, and eat with men alone, otherwise death would mysteriously fall upon him. The fact of his being suckled, however, which often goes on for two years, is quite overlooked. The women dislike bearing children, as they are so much in the way while they are at work in the fields, and heavy to carry about; so that, of twins, one is always neglected and starved till it dies; while a female child, if the population is thought to be getting too high, is treated in a similar manner—simply left to itself, uncared for, till it dies.

Circumcision takes place between the ages of five and ten. As far as I know, pig-killing accompanies this function, which is looked on as necessary to the continuance of the race. Before it takes place the boy goes naked; but afterwards he is costumed like the remainder of the men.

The naming of a boy is an occasion of much solemnity, and gives opportunity for a great pig feast. Usually several go through the ceremony, which consists principally in the seclusion of the candidates in a special fenced-round hut, where they must remain for periods of from 10 to 100 days.

During this seclusion the young man is known as "duli," and must neither wash nor see the face of a woman, and his meals are handed in all ready cooked for him. At the end of this chrysalis stage he emerges under his given name.

During lifetime he often changes his name, always under these rules; and after such a change it is both a great offence, and unlucky, to address him by his previous one. The change is always accompanied by a large payment of pigs by the candidate to the old men who arrange these matters (though the whole village enjoy the feast), and it is considered a highly "swagger" thing to be rich enough to afford it. I have not discovered what rules govern the number of pigs and the length of the "duli," nor if there is any superiority of one name over another, but I suppose that such exists.

Names are sometimes sacred, and as such are not allowed to be pronounced by the owner; it is always advisable therefore to ask a third person what another man's name is.

After large religious pig feasts new names are often given—as it might be "birthday honours"—to those who have been instrumental in giving and arranging them. A case of this occurred while we were at Uripiv, when the chiefs of the entertaining village went into "duli" for a period of thirty days. It should be added, however, that the "duli" is not very strict; and the young men undergoing it have no superstitious dread of breaking it through in some particulars, but do not let the old men of the village see them do so, for it is they who institute and keep the custom alive.

The next occasion in the young man's life is, probably, the investing of the belt. This latter is a broad band of nutmeg bark about six inches wide, which encircles the waist twice and is confined by a small strip of plaited grass bound outside it and knotted. An underneath strip of grass cloth or calico supports the very scanty clothing of these natives, so the belt itself may be considered as purely an ornament.

It corresponds pretty nearly to the "toga virilis," though it is frequently, and indeed usually, not attained (perhaps through lack of pigs) until a man is 19 or 20, or even older: it is never worn until after puberty is reached.

The obtaining of a wife is accompanied by many visits of arrangement and betrothal, pigs being presented on each occasion. The wife may actually cost—her net price, that is—from 10 to 20 pigs, according to her capabilities as a worker in the yam-patch (and perhaps beauty); but the whole cost to a husband, including his visiting and betrothal gifts, is seldom less than fifty.

Whenever opportunity offers, the youth, usually before marriage, goes to do three years' labour in Queensland on the sugar plantations. In Malekula this is considered as giving the true "*cachet*" of style to a man's education: and those who are too young to go, or having grown old have never been, will

usually pretend that they have, and vigorously learn up as much broken English as possible in order to let the "white men" think so. Some of them speak remarkably well; and altogether we surveyors found it a most useful accomplishment; those who had had experience of English masters being of great value as guides, carriers of baggage, and buyers of curios for us: in fact we never found them anything but friendly, and usually proud to serve us—of course for recompense of "tabak" (tobacco).

When old age and decrepitude arrives, the Malekulan has nothing to look forward to but burial alive. Should an old man (or old woman) become bedridden, or too enfeebled to look after him- or her- self, he is told, quite simply, that his burial will occur on such a day. Invitations to the funeral feast are then sent out; and, dead or not dead, on that date the unhappy person is buried. On very rare occasions he is, if still living at the time of his funeral, strangled. Mr. Gillan, the missionary before mentioned, told me that he knew of an old man who had been buried alive no less than three times. He had been strong enough to force his way out of his 12-inch deep grave, and then reappeared in the village. However, he was reckoned a dead man; and, as such, no one would give him food and, as his own property had been divided by his successors, he could get none of what had been his own. They buried him a second time, and again he reappeared; until at last on his third interment he died, too weak to continue resistance.

We were able to prevent the living burial of an old man who had been bedridden for six months; but, as he died somewhat suddenly on the same night, I have no doubt he was strangled. The extraordinary thing is that those who are nearest to the grave themselves are the most clamorous for the continuance of this barbarous custom. The young are by no means anxious for it.

At Aulua, a small mission station only twenty miles from Uripiv, where the customs just recounted are in force, the following practices, which appear to me a mere extension of the Uripiv ones, are in vogue. I believe, but am not certain, that they also extend to Port Sandwich, fifteen miles farther south, but I never could get the natives there to tell me about themselves.

Here *man*kind is divided into ten castes, as one may call them, corresponding to age in life; and it is in the state of rising a caste that the "duli" period occurs; probably a new name is given at the same time. The place of "dulis" is invariably a large fenced-in place on the dancing ground, and though the periods of isolation are shorter they are far stricter. The members of each caste mess together, and may not take

their meals otherwise, they also sleep together (when single): thus differing from the Uripiv people, where one "Man's House" does duty for the whole village.

With regard to women, they of course receive names in their youth in order to distinguish them, but there is no function with pigs or feasting, until, having arrived at a marriageable age, they are sold to the highest bidder. The little girls, like the boys, go naked until they are about five years old, when they adopt the woman's dress, an exceedingly scanty strip of pandanus fibre matting folded round the loins. They learn in their girlhood all that fits them to be man's slave and toiler in the fields, and also the arts of mat-making and weaving, at which they are very expert. They are sold into marriage at about fifteen, already showing signs of toil, though passably goodlooking; but four or five years later, having borne perhaps two children, they are little short of hags, with stooped frame and pendulous breasts; and so remain, getting more and more wrinkled and grey, until old age and probably living burial fall on them.

On marriage, a woman's identity sinks *absolutely*, even as far as losing the name by which she previously went. She has then *no name*. She is simply "the woman belonging to such a man." The husband can do what he please with his wife, his chattel, even to killing her, without fear of outside resentment. No brother or male relative would seek vengeance, as they would in the case of a man murder. In spite of the fact that nine out of every ten cases are apprehended, women frequently run away from their husbands. They get unmercifully thrashed and kicked on their almost inevitable return, yet they often risk it. In such case, the "co-respondent" is sought for also by the husband and his friends, and if possible killed.

Women often go to Queensland as "labour," their fathers parting with them to the recruiting officer for consideration and value received. They are said to be much better workers than the men and more easily governed. They always offer the final attraction to half-hearted recruits among the men-natives to take a passage to Queensland on board a labour ship; and as such are much sought after by recruiters.

As far as I know, a widow reverts to her own tribe at her husband's death, and of course may marry again. Probably they have then some voice in the matter, as I knew one old lady at Uripiv who was a person of great consideration, widow of a chief, who lived independently, covered with beads and armlets, and at the dances painted her face like a man and danced with the best of them.

Chiefs.

I was never able to accurately gauge the actual power and position of chiefs. In the Christian islands (by virtue of the missionaries) they are certainly of some consideration; probably on account of having reduced their number to only one to each village or tribe, and thus increased their prestige; but in Malekula there are numbers of chiefs, so-called, who have no authority to speak of, and certainly no dignity. They are distinguished above the remainder by wearing a bangle, pig's tusk, or bead, on the left arm; which, when made of beads, generally has a conventional face or "demits" on it, everybody else wearing theirs on the right arm. The chieftaincy is procurable by the payment of pigs for a feast, and thus is open to any who can afford it. I remember a small boy of about ten years of age who was a chief at Uripiv.

They certainly do not understand being made answerable for the ill-doing of their "subjects," and look upon themselves as very injured persons when so compelled by men-of-war.

In the Christian islands, on the other hand, they are beginning to feel like responsible men, though I have no doubt that formerly they were just the same as the chiefs of the still heathen islands, submerged in the barbarous condition of socialism, and quite unable to institute order, or command obedience, being not a bit better than their so-called "subjects." It is most noticeable that as the type of humanity in these islands improves, so the power of the chiefs improves also; this may be seen particularly in Fiji and Samoa, where far higher types are found than in the New Hebrides; and there the chiefs almost constitute a nobility.

In the Shepherd group and at Mai, which adjoins it, it was their extraordinarily intelligent custom to nominate the new chief some time before the death of the old one, so that on this latter's demise, the successor should be already settled on his throne, and well versed in the arts of governance. A party of us from the "Dart" accompanied the missionary (Mr. Michelsen) upon one occasion, at the crowning of a young chief. It was in its way a most impressive function; here were gathered together all the remaining chiefs of the island, five in number, and here were also about three hundred people, who, ten years before, were described as "treacherous cannibals," and were continually fighting, killing, and eating one another; but now clean, clothed, and in perfect amity, collected to assist at the elevation of the sixth chief. We white men-of-war people marched in procession with the chiefs, and had seats in what was the chancel of the big church schoolhouse of the village.

After prayers and hymns the old chief, who was giving up office, stood up, and placing the fingers of his right hand first on his own eyes and then on the head of the new man said, "Be thou Ti-Makati, God help you." Then all the remaining chiefs, joining hands with the old and the new one, stood in a circle with the missionary in the middle, and prayers were offered. The ceremony being concluded with a sermon and hymns, the earth ovens were opened, and soon the whole gathering were feasting on baked pig, the meat their soul loveth; while fowls prepared in the same way were our portion. It was a most pleasant and interesting ceremony.

It should be said that the chief usually takes his crowned name from the village of which he is master, in this instance Makati. "Ti" corresponds pretty nearly to "The," as chieftains in Ireland are styled, and in this case the whole name ludicrously resembles "The MacCarthy."

Religion.

As far as one can judge, it would appear as if at one time the religion of the New Hebrides group, certainly as regards the islands we surveyed, had been the same throughout. Segregation by island and village, aided by the fertile savage imagination, has altered the cult to some extent, but the fundamental religion was undoubtedly a worship of stones, some set up for the purpose in "high places," but often the queer-shaped volcanic and coral boulders of the coast in which resided the souls of those gone before. It was, in fact, ancestor-worship. Before proceeding to discuss it, however, I should like to mention an interesting discovery I made on a small volcanic island called Mau, lying off the east coast of Efate. Here I was shown by the natives a large stone lying in a field, on which was rudely carved an undoubted representation of the sun and of the moon; the former circular, about 18 inches in diameter; and the latter an ogee cut square at the top, also about 18 inches long. The natives said that they represented the sun and moon, and that "ole fella man e makum"; they certainly appeared to be very ancient. In the same field was another stone, set up like a small gravestone; and, as it leaned over, its carved face had not become so weather-worn as that of the other; on it was what I take to represent a skull. As these stones were of a hard volcanic nature, and, as such, certainly could not have been carved with the old shell and stone axes of pre-Christian days; and as, further, their worship-stones never, as far as I saw, bore representations of the sun or moon, this appears to point to an earlier civilization, from

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which these people have degraded in the same way as their language seems to have done.

With regard to their present worship (in the heathen islands) and to the original beliefs of the now Christian ones, the after-death hypotheses were these:—

In Efate (Mr. Macdonald says) the soul had to pass through six stages of existence, after which it died altogether. At the earthly death it arrived at the gate of Hades, which was situated at the west extremity of the island, at a place called Tukituki ("the very ancient"), and there encountered "Seritau," the cannibal executioner, and his assistants, Vaus ("question") and Maki ("don't know"). If it could not reply satisfactorily to these officials, it was handed over to Maseasi ("cutter out"), who cut its tongue out, split its head open, and twisted its head back side foremost. "Seritau" was the name of the man who in old cannibal days cut up the bodies for the feast, and therefore the divine representative of this person was looked on as the inflicter of the extreme penalty on criminals. In Efate two kinds of people were allowed to pass unharmed into Hades: those belonging to a certain tribe called Namtaku (a sort of yam), and those who had printed, or graven, or branded, on their bodies certain marks or figures (tattooed) called "mitiri" and "keikei."

In Malekula, the soul only dies three times in Hades; each time getting more ethereal, and finally fading out altogether. In its first state, that is immediately after earth life, it inhabits a region 30 miles below the surface of the ground, where it still bears a semi-corporeal existence; and to which region the sacred men have often been on a visit, and consequently know all about it. Here the dead order the affairs of earth, and punish with death those who transgress; especially in the matter of keeping them provided with pigs, etc. (whose ghosts they nourish themselves on), which are consequently sacrificed to them from time to time by their descendants. The souls enjoy this existence for thirty years, and then comes the second death, and so on as mentioned above.

The soul in this condition is known under the name of "Temate" (Aneityeum), "Natamata" (Efate), "tamats" and "demits" in Malekula, and his official hieroglyphic is a conventional face.

With regard to this place I may mention that in Uripiv I obtained a flute of bamboo which bore this, burnt on it, accompanied by a highly-conventional snake, lizard, ray fish (?), and parallel zigzag lines, which I was told meant water. These signs are connected with a flood legend at Aniwa (*vide* Mr. Paton), but I could get no meanings for them at this place.

The face I have seen cicatrized on a man's arm, and it is also on a large egg-shaped piece of hard wood, in my possession, which I take to be a "luckstone." The face is always called "demits," and also occurs, worked in shells or beads, on the chiefs' armlets, as before mentioned.

In consequence of the advent of Christianity I am unable to say whether in Efate "Natamata" was represented in the "high places" by a stone set up, but I am assured that he was by the rocks round the coast. Just to the north of Efate there arises from the sea a strange volcanic pinnacle 400 feet high, from a circular base of about 100 feet diameter; this was regarded as Nawota, the chief; and the native passing in his canoe bowed the head in fear and prayer.

Mr. Mackenzie, a missionary in Efate, showed me some sacred stones, of about the size and appearance of a large curtain ring, apparently made of a dark-coloured limestone, very well and smoothly fashioned, and of a mathematical accuracy of circumference of which I hardly think the existing natives are capable. These were the gods, or luckstones, of three of the villages converted by him; and of which, even in their converted state, they were so afraid as not to consider themselves safe unless they were under Mr. Mackenzie's care and keep.

In Malekula, coral rocks, generally of the slab order, and the more curiously indented by the sea and the coral polype the better, are set up on end with a sloped thatched roof over them, the supports of which were, in one instance I came across, carved to represent a man and a woman. This is placed in the middle of a semicircle, and on either side of it are attendant wooden "demits," each within a house of his own, consisting of a tree or fern tree trunk about six feet high, the top of which has a face of hideous and sometimes ferocious aspect, partly carved and partly shaped in clay, brightly and conventionally coloured. In front of these, as well as of the great stone, is a rude stone altar, like a low table, of one stone supported on two smaller ones. A "demits" stone that I saw at one village had what I take to have been meant for a crescent moon and a rainbow, both painted on it, this being the only instance of a moon I have seen, excepting the ancient carving before mentioned.

In all our islands, worship seems to have been conducted to the music of hollow log gongs. These are fashioned of bread-fruit tree trunks, 8 to 10 feet high, hollowed out, with a long slit down one side, and usually embellished at the top with a rough face. I am assured, however, that no worship was offered to them, much as they resemble idols. These drums are placed on end in a rough circle, over the whole area of which they are planted, leaving just sufficient room for a drummer to each.

Each drum gives a different note when thumped with a big wooden billet, the high notes being supplied by small hollow logs laid horizontally and beaten in brisk syncopated time to the loud boomings of the bigger drums. On a still night they may easily be heard three miles over the water.

On the island of Leleppa, the one heathen spot left in Efate, is a "napea" (as these drums are called), which differs from any I saw elsewhere, being decorated with birds, figures of men, fish, and other devices, besides the usual faces, and coloured brightly as well.

Sacred Men.

I was never able to quite establish the qualities of the Sacred Men, but they undoubtedly exist; I believe it is an hereditary office, which partakes more of the character of wizard and rainmaker than anything else. The religious dances, shortly to be described, were apparently directed by these persons, but no particular reverence seems to be shown to them. While we were in the Shepherd group, the last native to "take the book" (turn Christian) was a sacred man, whose sanctity was such that anything given to him by a white man had to be passed through the hand of a go-between.

In Efate, Mr. Macdonald says, "If a sacred man even passed a village where a death had occurred, or a house where a child had been born, he would immediately take steps to cleanse himself; this he did by a religious ceremony. A cocoanut was split open, and a prayer or incantation said over it, and its water sprinkled or poured over him and his companions. Another mode of purification was to break a forked branch from a particular plant, and, after the necessary prayer or incantation, to draw the branch down the body and limbs, sweeping away the defilement."

Dances.

The dances, generally religious or partly so, take place in the "high place" of demits, of which every village possesses one, generally a large circular or oval cleaning in the bush, with the demits in a semicircle down one side and the drums somewhere near the middle. In the dancing ground, or "emil," where the dance I am about to describe took place, there were ten demits of wood, five of which flanked on either side the central great coral stone, whose penthouse roof was supported by an unpainted carving of a man and a woman, while in front of it stood a smaller carved human figure, apparently ambisexed.

Planted round the "emil" were, as usual, croton bushes and dracœna trees, which greatly added to the beauty of the spot. Along the bush track, for about 50 yards before arriving at the ground, were set up quantities of small flat stones like rough gravestones; which were placed, one for every pig that had been sacrificed on the ground.

When a big dance is in prospect, as on this occasion, the demits are screened off by a plaited fence of reed grass, and practices for the ceremony take place there nightly.

We arrived at Uripiv, one evening, to hear that a great feast, a "Maki," was to take place the following day. This is a function which only occurs about once in three years, and as invitations had been sent to friendly villages far and wide, and a large number of pigs—over two hundred—had been collected for the feast, it promised to be very interesting.

As night came on we heard tremendous drummings and singings beginning in the "emil," and, although it was pouring with rain, we decided to go and see what was proceeding. When we arrived at the spot, on emerging from the pitchy dark bush track a most wonderful sight burst upon us. A black and streamy sky lowered over the inky dark shadow of the great trees round the place of gongs; and gathered there were about seventy or eighty men, all nearly naked, who, by the fitful flaring light of blazing reed torches, which each one bore, brandishing about, were performing savage dances and howling savage chaunts to the dinning of the gongs; their black wet bodies glistening in the torchlight as they madly whirled. When our little band of white folk appeared on the scene we were welcomed with a combined screech and shout, and were shown to a place where we might stand and look on at the practice. Bands of about twenty young men, in double file and holding hands, were chaunting to the gong accompaniment, while with their flat feet tapping loudly on the wet ground they swung round the gongs. In the far darkness of the other side we could see all the women standing, their entire faces painted bright red-lead colour. Their turn for dancing came later on, but we were not allowed to see it. "Very good, now you go away," they said, so we went. Not, however, before we had witnessed one ceremony prefatory to the next day's functions. Near the gongs stood a quantity of long bamboos, about 30 feet high, from the tops of each of which hung a large conventional figure of some sea bird, perhaps a frigate bird, with outspread wings. These bamboos had been standing some time as we had noticed them a month or so before; however, now they were seized by a party of men who, to much drumming and singing, gradually

swayed them from side to side, loosening them in the ground and finally increasing the sway, broke them down altogether, and they were then carried away.

Before going we were invited to the "*Maki*" of the morrow, which was to begin at about nine in the forenoon. Natives from all parts were there, having heralded their arrival in their canoes by the blowing of shell conches. All the men engaged in the function were painted with red and black, but not all in one pattern, and all had on their finest grass-matting tassels, "frills," and feather plumes, with which, and branches of croton or hibiscus stuck into their belts behind, they made a brave show.

The women were here as on the previous evening with their faces painted bright red all over and stood apart in a group together.

Affairs commenced by the appearance some distance off of a band of perhaps thirty men chaunting, and advancing in a solid body at a sort of jog-trot, making the feet tell together flatly on the ground at each step, and at the same time snapping their fingers loudly in time to the feet. One native told me that this was to drive away "debbleum"—a purification in fact. They pass through the dancing ground and disappear by an opposite bush track.

Shortly following came a second band, who, each carrying a large banana leaf, passed through in similar fashion, but without finger snapping. These prefatory ceremonies being completed the real business of the day began. A large band of drummers manned the gongs, and with unflagging energy kept up a tattoo, not unmusical, while the dancing proceeded.

First, several of the chief and sacred men of the village, whose "emil" this was, to the number of seven or eight, formed in a single open file, each armed with a conventional spear, consisting of a long bunch of reeds tufted at the end and much smoke-begrimed. These they poised in the air and caused to quiver while with a curious slow hopping movement (staccato on the gongs) they made a series of serpentine curves all about one end of the "emil."

While they thus danced, a body of men representing the village whose ground it was appeared, each armed with whatever weapon he could find—bow, spear, club, or musket, tremendously painted up, and each bearing also one large banana leaf. It may be imagined that they presented a highly picturesque appearance. They faced the old chiefs before mentioned, drawn up in a solid square, and sang a savage song of the "chaunty" nature, of many verses, each ending in a series of three shouts.

In front of the advancing band were three young girls who had their faces entirely reddened, and wore hanging over their forehead a fringe of snow white fowls' feathers, soft and fluffy, contrasting strongly with their black hair and red faces. Besides their usual waist cloth they wore on either shoulder a small roll of grass matting, dyed magenta, with a deep fringe of fibre tassels about 2 feet long, and they also had on all the shell ornaments, trade bracelets, Turkey red twill, and other finery that they possessed. In one hand they carried a bunch of cocoanuts adorned in the following manner. The plant had been allowed to sprout from the nut to a height of about 3 feet, when the young leaves had been stripped, leaving only the back ridge of each frond, and to these were tied at intervals small fluffy white fowls' feathers. The nut itself had the husk taken off and was painted in concentric black and red rings with a face painted at the end remote from the leaves. Each woman carried two or three of these, which she waved as she danced from one foot to the other.

After some delay and singing from the band, two men advanced carrying a large boar pig whose head had been covered with red paint: they were followed by a small boy, a chief (I believe he was the donor of it), who held a string made fast to the animal. This little procession then ran once round the gongs, which beat a wild and rapid tattoo, and stopping opposite the chiefs placed the pig on the ground. One of the old chiefs launched his (conventional) spear at the pig's side and then, without hesitation, hurled it at the fencing (it nearly hit me on the head as I happened to be standing in the way) at that part which concealed the "demits" to whom the pig was to be sacrificed. The pig was then held by the two men, while a third with a sharp wooden spear (now in my possession) thrust it into the side of the unhappy porker to a depth of 3 or 4 inches. The poor beast was then carried off, the fencing broken down where the spear had struck it, and bundled through to the altar of the "demits," to whom he was sacrificed, and to whose roof post he was then tied up.

This sacrifice was performed until each "demits" had his pig, usually a big one.

Mr. Gillan, the missionary, told me that these pigs would receive no more killing; they were, in fact, conventionally dead; but that when the time came for cooking they would be ripped up for cleaning out without more ado, and that if (as seems probable) the pig was troublesome over this performance, he would be just stunned to keep him quiet with a club or tomahawk. The real cause of death was disembowelling.

When all the "demits" had thus been provided with pigs the presenting village made a circuit of the gongs, dancing and chaunting, and then, seizing some old dried cocoanut leaf thatching, made a small fire with it and dispersed.

As far as I could learn only one village presented to the "demits," but after this presentation several more bands appeared who went through exactly the same functions as the others, accompanied with wild dancing, shouting, and firing of muskets. On these occasions, however, the pigs, much smaller ones, were received by representatives from another village, and were no doubt peace-offerings of some description.

There was no pains taken to spear, even conventionally, the small pigs, they were just taken by the hind legs and had their heads banged on the ground. Each party made a small fire after its presentation and then dispersed.

We did not stay for the cooking and eating of the pigs, but we saw plentiful evidence of it next day in the entrails which covered the island beaches, and by the disgusting lumps of pig meat which were lying in various directions near the "emil," generally in the forks of trees, surplus from the gorge of the previous day. Although such natives as have been in Queensland well understand the cleanliness, humanity, and, above all, convenience, of the European method of slaughtering and dressing pigs, yet they will never take the trouble to practise it. The meat is just torn up anyhow after cooking, and the entrails thrown away.

Some time after the "maki" I was shown at the "emil" by one of the natives, with much pride, the lower jaws of the sacrificed pigs, which with their huge curved tusks are "*tambu*" to the "*demits*" and cannot therefore be purchased. At one "emil" was a rack, sheltered by a most imposing roof, which was supported by fern tree trunks carved like demits, to which was lashed considerably over one hundred such lower jaws, some with magnificent tusks, one even had two tusks, on one side. I noticed that now since the "sacrificing" all the reed screen in front of the demits had been entirely removed.

For a long time after the feast, drumming and lugubrious chaunts could be heard continuing almost all night, supposed to be in connection with the "maki," but no one, not even themselves I believe, understand their reasons for thus worshipping.

They say that they have no idea why they do it—"Ole fella man befo me, e makeum"—their fathers did it before them, so they continue it, the reason for it being now lost.

At Port Sandwich I witnessed the following "pig paying," differing a good deal to the Uripiv affair just recounted.

The payment of pigs is generally the sign of a peacemaking between two villages who have been in disagreement, and is of common occurrence. In this district the function takes the form of a sort of sham fight in which the village which is going to pay pigs is defeated, thus giving a (conventional) pretext for the payment.

At one end of the "emil" had been constructed a kind of small fence about 30 feet long, formed by sticking ten slight stakes in the ground and interweaving between them banana leaves to a height of 3 feet. The end stakes were croton boughs with the leaves on, and the remaining eight were stripped and had the upper end pointed. On each point was stuck a cocoanut in its husk which was itself adorned with a stiff piece of pandanus fibre about 2 feet long on which white fluffy feathers were tied at intervals, this was stuck into the top of the nut and waved in the wind.

The receiving party occupied this, the fence end of the "emil," and stood about twenty in number all highly and curiously painted in red and black, while several had tiny white feathers stuck at regular intervals over the right hand half of their woolly hair, giving them a most remarkable appearance.

Each was armed with two short stout poles of cotton wood, which were held upright in the hands, and touching one another so as to serve as a shield. The gongs began to beat, gradually increasing in speed and loudness, and as the crescendo was reached the shielded party ran forward holding their shields at arm's length, while looking guardedly from side to side, moving their shields to match, as if on the look-out for a foe, and advanced to the other end of the ground; there being no one there to attack them they then retired bounding in the air and howling.

This continued with scarcely any interval for about a quarter-of-an-hour, when there appeared at the further end the paying party, of equal numbers, but all painted in black only, and looking most diabolical in consequence. Each man carried in his right hand a young cocoanut in its husk of a convenient size for throwing. These advanced on the shielded party with threatening air and when about 10 yards off the front men of the party suddenly wheeled and threw their cocoanuts with the utmost violence at the others. Had these not had shields many would certainly have received severe injury, as the cocoanuts were all quite shattered on the shields, indeed, the accidental blow from a nut on such an occasion, which of course sometimes happens, is a fruitful source of real fighting.

This engagement was renewed three or four times, both parties

shouting and howling, until at last all the cocoanuts were exhausted, and the shielded party gave a shout of triumph. They had conquered. The black faces retired and presently two appeared bearing a fine fat pig. This was taken alive and tied to one of the posts of the little fence before mentioned, and so on until all the stakes had a pig tied to it. When all the pigs had been received, and not even conventionally killed, the old chief of the receiving village first broke down the two croton boughs at the ends of the fence, and then tumbled the cocoanuts off the other posts to which the pigs had been tied. The payers then brought a small sucking pig, killed it by banging its head upon the ground, left it there, and the ceremony was concluded.

Rainmaking.

I never actually witnessed the making of rain, but the following legend reached me from Ambrym, a large island with an active volcano, which closely adjoins Malekula, and is still altogether heathen, or nearly so.

Towards the end of 1890, just after the yam planting, there had befallen an unusually dry season; so an inland tribe of Ambrym went to its rainmaker and said, "Make us rain, or our yams will not grow, and we shall starve." He consented, and straightway set to work to weave a sort of hurdle of the branches and leaves of a tree famed for its rain-producing qualities.

This hurdle being constructed, it was placed, with suitable incantations, at the bottom of what should have been a water-hole in the now dried bed of the mountain torrent, and it was then loaded with heavy stones. Down came the rain in tropical torrents; we, in the "Dart," lying in Port Sandwich, close by, received a full benefit of it, as it never ceased for forty-eight hours, and the entire surface water of the harbour was quite fresh to the depth of three or four inches, and so remained while the tide rose and fell four times.

Soon the dried nullah was a foaming torrent, and the rain-making hurdle ten feet deep in hurrying water; and then to their dismay the people saw that the yams with their surrounding earth were beginning to slide down the hill sides, and would soon be lost altogether.

Now mark what comes of fooling with the elements! No man of the hill country was able to dive to the bottom of the water hole to pull up the hurdle with its weight of stones, so the merciless rain still held on. At last the shore natives, accustomed to swimming and diving, heard what the matter was, and some of them coming to the assistance, the compeller of the

elements was recovered from its watery bed and—the rain stopped!

Narak.

A short account of a species of witchcraft, in constant use among the inhabitants of the populous island of Tanna, may, in conclusion, prove of interest. It is called in the Weasisi dialect "Narak," and curiously resembles the almost world-wide habit of revenge by which the death of an enemy is secretly compassed through making his effigy in wax, sticking it full of pins, and slowly melting it in a fire.

To almost every village in Tanna there is a sacred man, who is hereditarily a Narak burner. Somewhere concealed on his premises, in a spot known only to himself, is a "family" (as they are called) of Narak Stones. One of these "families" was recently accidentally disinterred in his garden by a white trader living on the island. Their existence had been forgotten, but they were immediately recognized as Narak Stones by the natives, who showed the greatest dread of them—so much so, in fact, that they had finally to be sent out of the island, and were deposited in the Melbourne Museum, where, I believe, they now remain The largest of them, "the father," had upon its surface natural indentations which (to the native eye and imagination only) represented a man squatting on his hams. The others, which were all smaller, were said to resemble parts of the body—an ear, a tibia, and so on; but this resemblance, if any, was quite fortuitous, as none of the stones had ever been touched by a tool.

Such a "family" of stones, then, is concealed in or near the Narak burner's hut, and works revenge on whomsoever their owner wills. The system is as follows: A desires revenge—illness or death—on B. He accordingly manages to obtain some article that has been in close contact with him—the skin of a banana that he has eaten; a cloth which has touched the sweat of his body, etc., which is then carefully rubbed over the leaves and twigs of a certain tree, and is afterwards rolled and bound up with them into a sort of long sausage-shaped affair. A then takes this, the Narak stick, with proper payment, to the Narak burner; who, on coming to terms with A, lights the sacred fire near the stones, and begins to slowly burn the Narak stick.

When the stick begins to be consumed by the fire, B begins to fall ill; and when it has altogether become ashes, he dies.

The missionary assured me that he has only once known Narak-burning to fail: on an occasion when a Christian convert had been the object of revenge, and that the other natives

explained his immunity from it from the fact that Yahova must be the stronger god.

The man who falls ill from Narak-burning may always, by discovering who is burning it, and then paying more than his enemy to the burner, have the Narak stick removed from the fire, and so recover. A white trader living on the island has had his Narak taken twice; on each occasion he has fallen ill, been told by his friends who was burning his Narak, paid to have it removed from the fire—and on each occasion he has recovered.

I can only suggest, in explanation, that when a man falls sick he naturally immediately attributes his illness to Narak-burning, and then biologises himself into getting worse, or paying his fees and recovering, as the case may be.

All the Tannese carry small baskets about with them into which they put banana skins, cocoanut husk, or any refuse from that which they may have been eating; in order to avoid its discovery by an enemy for the purposes of Narak, until reaching and crossing a stream of running water, which alone has the power of annulling Narak. A man who has taken another's Narak will walk round miles to avoid crossing a brook, and thus losing his lately gained power over him.

Narak has so strong a hold in Tanna that all the continual fights and feuds on the island are attributable to it; and while the closely adjoining islands have been Christian for several years, Tanna alone, after sixty years of missionary labour, can only show about half a dozen communicants as a result.

I am glad to be able, in the few preceding notes, to place on record some of the more interesting features of a savagery which, at the present rate of decline in Efate and other islands, seems to point to a complete extinction—either through the introduction of Christianity, or by the present rapid dying out of the inhabitants—at no distant date.

A steamer now runs round the entire group once in a month, connecting at Fila, in the island of Efate, with the Fijian boat running thence to Sydney, and thus to one interested in the ethnology of the very mixed races inhabiting these islands, a large and comparatively unexploited field of no small value to science lies within what is, in these modern days of locomotion, an easy distance.

Explanation of Plates I and II.

PLATE I.

Fig. 1.—A Dancing Ground near Port Sandwich.

Drums in the foreground, and behind them is a "demits" under a thatch roof, made prominent by the tall dead bamboos rising in the background.

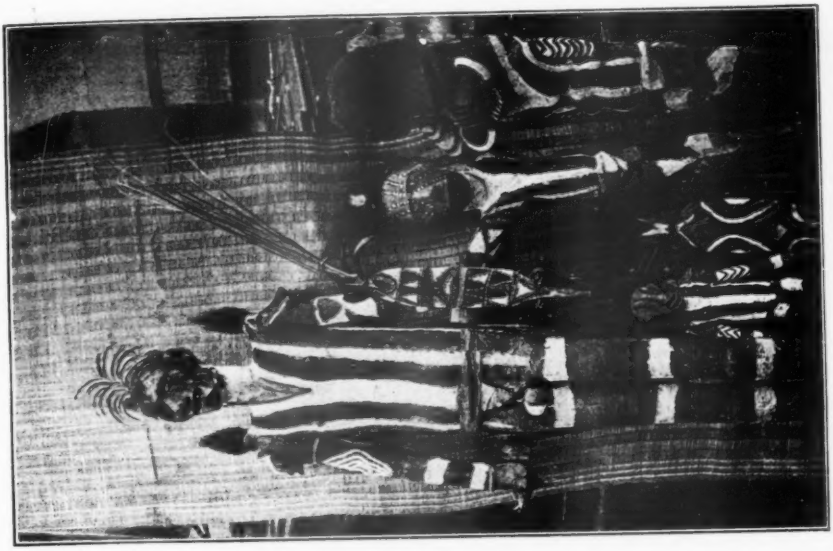


FIG. 2.

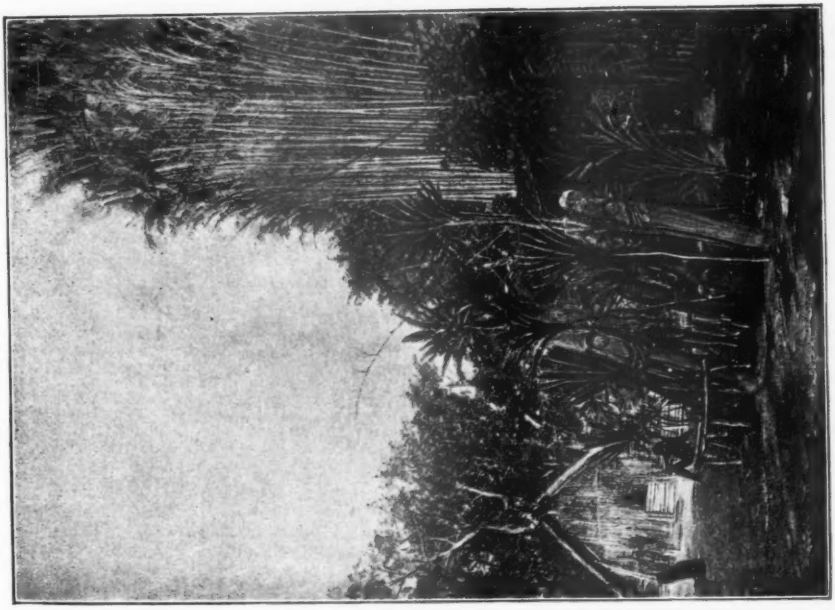


FIG. 1.

FIG. 2.

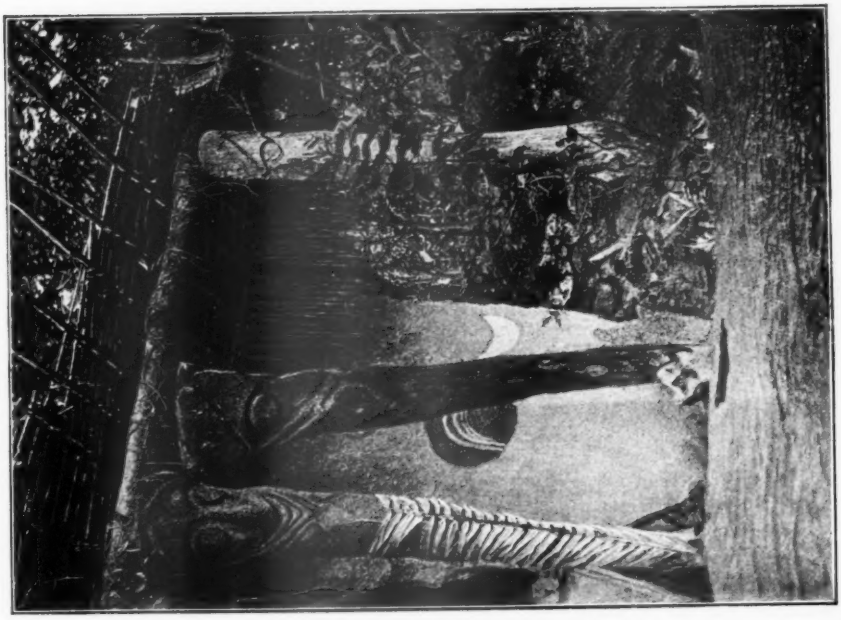


FIG. 1.

On the left is the "tambu house" with two old men sitting in front. Here are kept the "fish" and masks, "tambu hats," used in the dances.

Fig. 2.—A Group of so-called "Mummies."

These represent chiefs gone to the Shades and become "demits." They were brought on board at Port Sandwich, and were said to be from some inland village. The tall one on the left and the next largest have red skulls covered with sun-baked clay to make them look like faces. The body of the large one is made of bamboo frame, wattled and dabbed, and brightly coloured in red, black, and white. He holds in one hand a pig's jaw, and a "fish" in the other. The smallest of all is entirely clay, or rather mud, and twigs, and his head is founded on a cocoanut. The right hand one (with pigs' tusks) is a fern tree stump with a baked mud face, all brightly coloured.

The "fish" (so-called by the natives) is made of wood, and coloured; it is held in the hand while dancing, and was only placed in the mummy's to be photographed.

PLATE II.

Fig. 1.—A "Demits" at Uripiv Island.

With the usual supporters with carved faces—made of fern tree stumps.
On the stone a crescent moon and a rainbow (?) in colours.

Fig. 2.—A "Demits" at Uripiv Island.

The stone is the "demits" and the attendant figures—a man on the left of the photo, a woman on the right, and (I fancy) an ambi-sexed creature in the centre are, as far as I could learn, accessories and supporters to the coral stone, which is the real object of worship.

NICOBAR POTTERY.

By E. H. MAN, C.I.E.

[WITH PLATE III.]

REGARDING the origin and manufacture of pottery by the Nicobarese, no traditions are seemingly extant, but a belief exists that in remote ages the Great Unknown, whom in later times they were taught by the missionaries to call Deuse, decreed that on pain of certain serious consequences—such as an earthquake or sudden death—the manufacture of pots was to be confined to the one small island of the group known to us as "Chowra," and that the entire work of preparing the clay and moulding and firing the pots was to devolve on the women of the community: it is further related that many years ago a Chowra woman while on a visit in one of the central islands thoughtlessly acted in contravention of the prohibition and attempted to make a cooking pot, but she forthwith paid the penalty of her

disobedience with her life. This incident has consequently been held as confirmatory of the genuineness of the command and a warning against any rash trifling with the restrictions, which though imposed in far-off times, are yet of importance to be observed.

The clay employed in the manufacture—though perhaps the best available—is not specially well adapted for the purpose, and moreover the monopoly during a long series of years having led to the exhaustion of the limited strata at Chowra, the requisite supplies of material have for many years past been obtained from a spot on the northern slopes of Teressa; as this necessitates a sea-trip of about five miles, the voyage is only undertaken in settled weather. The duty of procuring the clay and the sale of the finished article constitute the entire responsibility of the Chowra men in respect to the main industry of their island.

Indian pots[1] and jars are purchased from traders who import them from Bombay, Penang, the Coromandel coast and Burma, and these, though stronger than those locally produced, are from their form—being provided with necks—unsuitable for steaming and boiling the Pandanus fruit, and are therefore reserved for cooking meat, fish, vegetables and rice which, however, might be equally well prepared in the home made utensil.

The Nicobarese pots are of six prescribed sizes, viz.:—

1: *kentâha-lama-ok'*, measuring about 27–28 inches across.[2]

1A: *kentâha-lama-oal* „ „ 23–24 „ „

[1] The Indian pots are of four sizes and are made and used as follows:—(a) the largest (*tòint*) used for cooking rice, fish, pork, and buffalo-beef; (b) a smaller size (*kochī*) used for boiling pork, dripping, and for mixing the Pandanus paste; (c) the third size (*hulŭ*) serves for boiling rice and jungle pork; while (d) the fourth size (*hidânh*), is used indiscriminately for boiling vegetables, fish, fowls eggs, and pork of either kind. All these pots are purchased and kept on hand partly for general use and partly as a reserve stock in case they should run short of Chowra pots which they profess to prefer, though less durable, they however admit that they have some fear lest they should incur the resentment of the local manufacturers by patronizing exclusively the foreign article, and it seems more than probable that if the Indian pots were procurable in the same sizes and shape as those made at Chowra, the local trade would suffer considerable loss and eventually have to be abandoned.

[2] From superstitious motives the use, or rather the purchase and ownership, of this large utensil is confined to the old members of the community some of whom use them when giving a feast. Young persons rarely if ever use a larger size than the han-shöi whatever the occasion may be, but they may eat food prepared by those whose age entitles them to the honour of cooking with a kentâha. The responsibility of deciding whether the proper age for possessing a kentâha has been attained is a personal matter, and though contrary to their ideas of the fitness of things, no one would prevent a young man from using a kentâha if he had the presumption to assume this prerogative of his seniors. As the kentâha is used throughout the archipelago by only a limited number of persons, comparatively few specimens of this large size are produced, and care is taken to select the hottest season of the year as the most favourable time for their manufacture.

2: *haṅ-shŏi-lama-ok* measuring about 18–19 inches across.
2A: *haṅ-shŏi-lama-oal* „ „ 16–17 „ „
3: *itâsha-lama-ok* „ „ 15–16 „ „
3A: *itâsha-lama-oal* „ „ 13–14 „ „
4: *henpak-ngaich-lama-ok* „ 13–14 „ „
4A: *henpak-ngaich-lama-oal* „ 11–12 „ „
5: *panòkenlait-lama-ok* „ „ 11–12 „ „
5A: *panòkenlait-lama-oal* „ „ 9–10 „ „

6: *tafâl.* Five different sizes measuring from 3–4 inches across the mouth which are used for boiling water and eggs only.

The largest of these pots is used only on feast days and for boiling pork. Sizes 2, 2A, 3, 3A are used for boiling pork, pandanus, and cycas paste, on ordinary occasions, while Nos. 4, 4A, 5, 5A, are kept for boiling fowls, rice, vegetables and for making cocoanut oil; it will thus be seen that these utensils are not employed for cooking fish, which is prepared exclusively in Indian pots.[1]

As will be inferred from the measurements just given the pots are made in pairs of unequal dimensions so that they may be fitted one inside the other, and it should be mentioned that each pot has moreover a fixed market value.

With the exception of the tafâl, the various sizes are made with the lips curving more or less slightly inwards; they may be described as of an oblate-spheroidal form, and in the four medium sizes it is not uncommon for the larger size of one variety to correspond approximately in capacity with the smaller size of the next larger description. The reason for this want of uniformity will be understood when the crude method of manufacture has been explained, and it will be readily seen that though not intentionally so made, or arranged, it is quite possible, with a little patience, to procure a nest of the six sizes which will fit one inside the other. Judging from their symmetry I was prepared to learn when first making enquiries on this subject (1871) that these vessels, or at all events the larger sizes, were moulded with the aid of some rude form of potters-wheel and certain statements made to me by the natives of the central group confirmed me in my erroneous surmise as to the existence in these islands of some such apparatus until I had an opportunity of observing the process for myself.

In answer to many enquiries I ascertained that the quality of

[1] These jars are called *shitōn* and are extensively employed throughout the group chiefly for the purpose of catching rain-water as it falls from the under side of a slanting cocoanut tree; a spout is formed by an upward cut with a dha, and the mouth of the jar, permanently kept immediately below, receives the flow on the fall of every passing shower.

the clay used for the various sized pots is the same and that owing to the difficulty of drying the unbaked utensils during the rains, the manufacture of small pots only is attempted at that season of the year.

It was on the occasion of one of my official visits to Chowra that I was fortunate enough to have a chance of photographing and observing at close quarters the different stages of the manufacture, for it so happened that some women were busily engaged in shaping while others were firing previously prepared pots.[1]

Having prepared a quantity of clay by freeing it from small stones and other extraneous matter, and having kneaded it with fine sand until of a proper consistency, the operator seated herself on the ground and placed before her a piece of board on which she laid a ring or hoop (*osîawa*) about 8 inches in diameter made of cocoanut leaves neatly bound together, this served as a stand for a shallow dish (*entâna*) in which was placed a circular piece of plantain leaf for the purpose of facilitating the manipulation of the clay by preventing its adhesion to the unglazed surface of the platter. With one or more handfuls of clay according to the size of the pot to be constructed, the base of the utensil was roughly shaped on the entâna, then rolls of clay of the required thickness and previously prepared were built up layer after layer until the proper dimensions had been attained.[2] The operator the while turned the pot round and round, shaping it with her eye and hand; the result proved that long practice had made her quick to notice and correct any defect in her work in respect to symmetry of form whether through excess or deficiency in the thickness of the roll.

When the desired shape has been realized sufficiently to allow of the work being subsequently perfected the vessels are set aside on a raised platform to dry for one or two days according to the size of the pot and the state of the weather; the *tafâl* only,

[1] When I witnessed the pot-making at Chowra, I was accompanied by two natives of the central group who, in spite of frequent visits to the island, had never before seen the process, it not being customary with these people, and especially with the inhabitants of that island, to gratify idle curiosity on the part of visitors and strangers, but to intimate, if necessary in plain terms, that their room will be preferred to their company, or in the case of Europeans to endeavour to mislead them or to attract their attention to some distant part of the island.

[2] The variation amounting to an inch or more in the size of pots of the same class is due to the rule of thumb method which they employ for regulating the dimensions of these utensils: there being a wide range in the diameter of pots of the same form, no properly shaped pot between 9 inches and upwards of 20 inches across the mouth, would be reckoned too large or too small to be included under one or other of the varieties aforementioned.

it seems, on account of its diminutive size, can be moulded and trimmed for the final firing in one day.

When a pot is deemed sufficiently dry for trimming and finishing it is taken from the platform and any superfluous clay in the interior is scraped off with a Cyrena shell, after which it is reversed and all excess of material externally is removed by means of a fine strip of bamboo (*danun-karīang*) which is frequently moistened with water—as are also the fingers of the potter—and gently passed over the inner and outer surfaces of the vessel in order to smooth them and give an appearance of finish to the work. The rim is also carefully made of as uniform a thickness as is possible with so rude an implement as the danun-kariang.

The pot is then replaced on the platform under the hut to harden for another 8 or 10 days before it is considered fit for the final process of firing. For this latter purpose a primitive kiln is prepared in some open space near the hut and bits of broken pottery are stuck in the ground a few inches apart, and in such a manner as to form a rough stand for the pot which is placed bottom upwards with the rim resting on the potsherds, and some 4 or 5 inches off the ground; in the space immediately under the pot a layer of fine wood ash and a quantity of cocoanut shells and scraps of firewood are heaped up and then a peculiar wheel-like object, called hiwat, of larger circumference than the pot, is laid on its up-turned base; against this are rested the branches and firewood which are to be lighted outside the vessel but which must not be allowed to come in actual contact with it, the length of these billets is of course regulated somewhat by the size of the utensil in course of firing.

When all these arrangements have been completed the fuel under and round the pot is kindled and the flame fanned if necessary by two or three women who, armed with sticks about 5 feet long in both hands, act as stokers, propping up and replacing the burning logs until the vessel is supposed to be sufficiently baked; it is then carefully removed by means of the above-mentioned sticks, and left to cool upon a bed of fine sand where, too, it receives the black stripes without which no Nicobarese pot is regarded as finished. This painting is a very simple process, being accomplished by means of strips of unripe cocoanut husk about 1 or 2 inches broad, which are laid on while the pot is yet hot; the stain produced by the acid juice contained in the husk turns black the moment it touches the heated surface, and a few seconds suffice to paint the requisite number of stripes down the sides and along the inner and outer edges of the rim; while so employed the *artiste* keeps the pot in

position by means of a cocoanut shell cup, which she holds, edge outwards, in her left hand to save her fingers from being burnt.[1]

Finally, by way of giving a finish to the work, a handful of the moist strips of husk, wherewith the dark lines have been made, are passed over the entire outer and inner surfaces, with the result that the acid not having been completely extracted, imparts a peculiar light copper colour to the parts not already stained with a deeper dye.

In order to identify pots it is a common custom to mark them before they are fired with some device peculiar to the maker, care being taken not to infringe upon the "rights" of others by adopting any sign likely to lead to confusion. These "trade marks," so to speak, may be observed either on the rim or on the outer surface of the pot, according to the space required for their portrayal; some sharp-edged tool, such as a dhá knife, or spear is used to make these designs.[2]

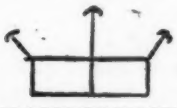
The aggregate number of pots made in the course of the year could hardly be ascertained with any degree of accuracy, but having regard to the small number of hands employed in the work—it must be very considerable; it appears that the largest demand is for the second and third sizes, and afterwards in order come Nos. 4, 5, 6, and 1; the smallest sizes *tafâl* are only sold in the neat little bundles usually containing five, which

[1] These implements are made of different dimensions to suit the larger and smaller kinds of pots. The method of construction is as follows:—

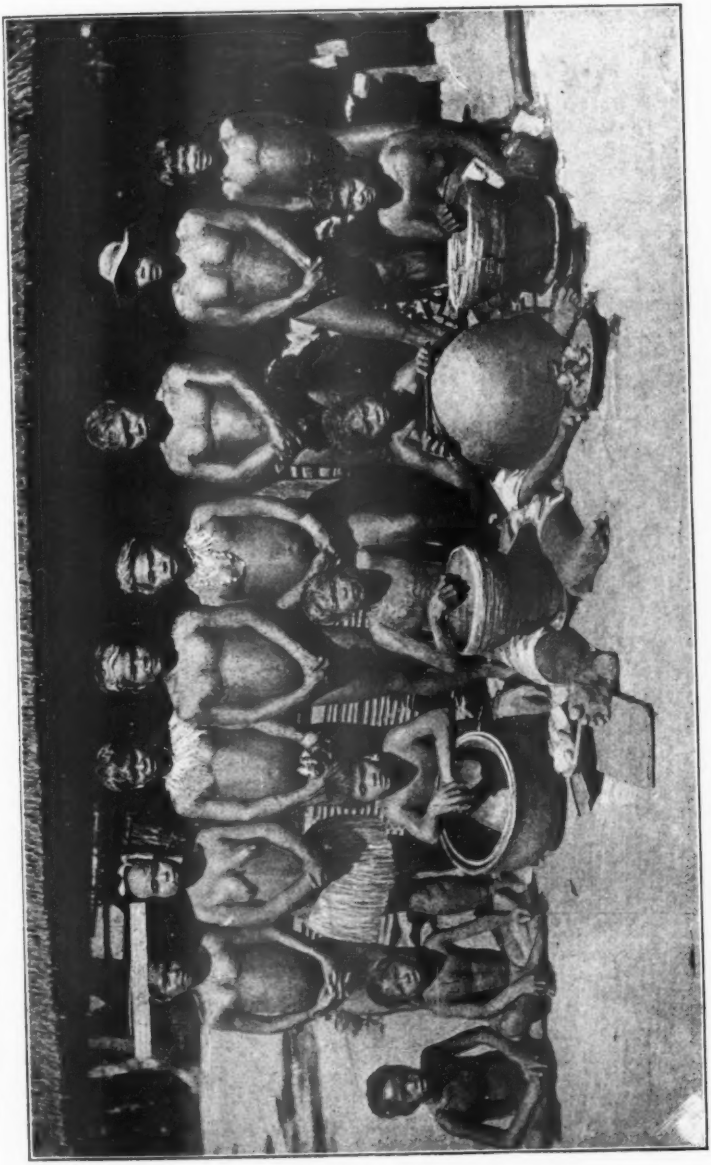
A circular lump of clay, similar to that used for the pots, is placed upon a plantain leaf, and on it is laid as a pattern another specimen, the outlines of which are sharply defined along the inner and outer edges with a knife, the model is then removed and a perfect duplicate is obtained, these objects are not baked, and are not considered ready for use under six months.

[2] The following are examples of "trade-marks" recently observed on the rim of a pot:—

REDUCED SKETCH



OF A DESIGN BELOW OUTER LIP OF ANOTHER POT.



NICOBARESE POTTERS.

are called "*kamintap*," or "a set of five." Experience has taught the natives that to ensure the serviceableness of the pots for any length of time it is necessary to store them for a year or so in the heat and smoke of the huts; newly-made pots are therefore placed bottom uppermost on the lattice-work platform (*lenpā*) with which huts at most of the islands are furnished in the space under the roof where the combined action of heat and smoke render the utensils hard and durable, so that they may be reckoned as good for a year's service, while freshly made pots, or those which have not been properly seasoned in the above manner, have been known to "fly" or become useless, if not at the first trial, at least within a brief period.

No earthen vessels are made specially for funeral purposes, but it is customary on the occasion of a death, for the relatives of the deceased to place on his or her grave, two of the largest pots as well as four smaller ones; they are there left for about six months, and then thrown away into the jungle, together with such other articles, *e.g.*, spears, etc., as have been similarly deposited.

No porous pottery to serve for cooling drinks or any other kind of earthenware than that above described is manufactured, nor do the Nicobarese ever attempt to produce clay figures of men or animals.

MARCH 21ST, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The election of CHARLES JAMES LONGMAN, Esq., of 27, Norfolk Square, was announced.

The presents that had been received were announced, and thanks voted to the respective donors.

Dr. E. B. TYLOR read a paper on "The Tasmanians as Representatives of Palæolithic Man."

Mr. J. A. BROWN, Dr. J. G. GARSON, and others took part in the discussion.

A paper by Professor POLITIS on "Burial Customs in Modern Greece" was read.

A paper by the Rev. J. MATHEW on "The Cave paintings of Australia" was read.

ΕΛΛΗΝΙΚΗ ΛΑΟΓΡΑΦΙΑ

Περὶ τῆς θραύσεως ἀγγείων κατὰ τὴν κηδείαν.

Τὸ καὶ πολλοῖς ἄλλοις λαοῖς ἔθιμον τῆς θραύσεως παρὰ τοὺς τάφους ἀγγείων, ἀφιερομένων εἰς τοὺς νεκροὺς ἢ εἰς τὴν κηδείαν χρησμευσάντων, τηρεῖται καὶ παρὰ τῷ καθ' ἡμᾶς Ἑλληνικῷ λαῷ, κατάλοιπον κατὰ πᾶσαν πιθανότητα ὃν τῆς ἀποτάτης ἀρχαιότητος. Διότι διὰ τοῦ ἐθίμου τούτου δύναται νὰ ἐξηγηθῇ ἡ εὕρεσις θραυσμάτων κεραμείων ἀγγείων ἐν τῷ ὑπὸ τοῦ ἀνωτάτου ἀνοίγματος τῶν ὑπὸ τοῦ Κυρίου Χ. Τσούντα ἀνασκαφθέντων Μυκηναίων τάφων σχηματιζομένῳ βάθρῳ, τῷ πρωπριομένῳ ἴσως εἰς χοάς[1], καθὼς ἐπίσης καὶ οἱ μεγάλοι τῶν κεραμίων σωροὶ ἐν τῇ ἀρχαίᾳ Ἀλεξανδρείᾳ, ἧς αἱ πρὸς ἀνατολὰς καὶ μεσεμβρίαν τῆς νεωτέρας πόλεως ἀνωφέρειαι καὶ οἱ βουνοὶ συνίστανται ἀποκλειστικῶς ἀπὸ τῆς κορυφῆς μέχρι τοῦ εἰς βάθος 8–16 καὶ πλειόνων μέτρων ἀρχικοῦ ἐδάφους ἐκ στρωμάτων τεθραυσμένων κεράμων Αἰγυπτιάκων, Ῥωμαικῶν καὶ Ἑλληνικῶν διαφόρων ἐποχῶν, ἀπὸ τῆς κτίσεως τῆς πόλεως ὑπὸ Ἀλεξάνδρου μεχρὶ τῆς ἁλώσεως αὐτῆς ὑπὸ τῶν Ἀράβων[2]. Οὗτος δὲ κατά τινας εἶναι ὁ λόγος δι' ὃν ἐνίοτε τὰ ἐν τοῖς ἀρχαιοῖς Ἑλληνικοῖς τάφοις εὑρισκόμενα ληκύθια ἔχουσιν ἀποκεκρουσμένον τὸν πυθμένα[3], καὶ πολλὰ καθόλου τῶν κτερισμάτων φέρουσι τὰ ἴχνη ἐπίτηδες ἐπενεχθείσης αὐτοῖς βλάβης ἐν τοῖς Ἑλληνικοῖς τάφοις[4], καὶ ἐν προϊστορικοῖς τῆς βορείου Εὐρώπης[5].

[1] Βλ. Che. Belger, ἐν *Berliner philol. Wochenschrift*, 1891 (col. 707).

[2] Τ. Νεροῦτσος, Κεραμίων λαβαὶ ἐνεπίγραφοι, ἀνευρισκόμεναι ἐν τῇ ἀρχαίᾳ Ἀλεξανδρείᾳ, σ. 3 κέ. καὶ ἐν Ἀθηναίῳ (περιοδικῷ συγγράμματι Ἀθηνῶν), 1874, τ. iii. σ. 215 κέ.

[3] Hermann-Blümner, *Griechische-Privatalterthümer*, 1882, σ. 380.

[4] Hermann-Blümner, αὐτ.

[5] Olshausen, ἐν *Verhandlungen der Berliner Gesellschaft für Anthropologie &c.*, 1892, σ. 166 κέ.—Νῦν ἐν Ἑλλάδι σχίζουσι τὰ συνθαπτόμενα τῷ νέκρῳ ἐνδύματα καὶ ὑφάσματα· ἀλλὰ τοῦ ἔθους τούτου λόγος φέρεται ἡ

GREEK FOLKLORE.

On the BREAKING *of* VESSELS *as a* FUNERAL RITE *in* MODERN GREECE.

Translated from the original of N. G. POLITIS, Professor at the University of Athens, by LOUIS DYER.

THE custom in question obtains among many peoples besides our own, and elsewhere as in Greece is probably a survival from the very remotest antiquity. Vessels either especially dedicated to the deceased or else having been used in the funeral-rites are broken at the grave. This custom may explain the discovery of fragments of vases on the raised-step (Βάθρον) at the upper opening of the tombs excavated at Mycenae by Mr. Ch. Tsountas. Certainly libations could naturally and properly be made at this step.[1] Perhaps the same explanation accounts for the huge heaps of potsherds at Old Alexandria, where, east and south of the modern city there are mounds consisting exclusively,—down to a depth which ranges between 8 and 16 metres,—of Greek, Egyptian, and Roman potsherds belonging to various epochs and deposited in successive layers beginning with its foundation by Alexander and ending with its capture by the Arabs.[2] This rite, requiring as it did the fracture of ritual vessels, serves to account—as some think—for the numerous *lecythi* with their bottoms broken away which are found in ancient Greek tombs,[3] for this reason, too, most funeral offerings, both in the tombs of Greece,[4] and in those of prehistoric Europe[5] bear unmistakable marks of intentional mutilation of some kind.

[1] See Chr. Belger in the *Berliner Philologische Wochenschrift*, 1891 (col. 707).

[2] T. Neroutsos, *Inscribed handles of vases found at Old Alexandria*, p. 3 ff. See also the *Athenaion*, an Athenian periodical, 1874, vol. iii, p. 215 ff.

[3] Herrmann-Blümner, *Griechische Privatalterthümer*, 1882, p. 380.

[4] Herrmann-Blümner, *op. cit.*

[5] Olshausen, *Verhandlungen der Berliner Gesellschaft für Anthropologie*, &c., 1892, p. 166 ff. To-day, in Greece, they cut all the clothes and wrappings of the dead, but the current reason given is that this is done to guard against depredations from the riflers of tombs, and there is no reason for going farther afield to account for it.

Ἐν Ἑλλάδι νῦν θραύονται πήλινα ἀγγεῖα ἐπὶ τοῦ τάφου καὶ πρὸ τῆς οἰκίας, κατὰ τὴν ἔξοδον τοῦ νεκροῦ, ἐνιαχοῦ δὲ καὶ κατὰ τὴν ὁδον, ἣν διέρχεται ἡ ἐπικήδειος πομπή. Ἀπανταχοῦ σχεδὸν τῆς Ἑλλάδος, καθ' ἣν στιγμὴν οἱ νεκροθάπται καταβιβάζουσι τὸν νεκρόν, ὁ ἱερεὺς ἐκφωνῶν τὸ γραφικόν: Γῆ εἰ καὶ εἰς γῆν ἀπελεύσῃ [1], ἐπιχέει ἐπὶ τοῦ τάφου ὀλίγον ὕδωρ ἐκ λαγήνου πρὸς τοῦτο κομιζομένης, ἥτις πάραυτα θραύεται καὶ βάλλει θράκα χώματος· ὁμοίως καὶ οἱ παριστάμενοι εἰς τὸν ἐνταφιασμὸν νομίζουσι θρησκευτικὸν καθῆκον νὰ ῥίψωσι χῶμα ἐπὶ τοῦ νεκροῦ, ἐμφωνοῦντες: Θιὸς σχωρές τον, ἑπόμενοι οὕτως ἀνεπιγνώστως τῷ παλαιωτάτῳ Ἑλληνικῷ νόμῳ τῷ κελεύοντι τοῖς περιτυχοῦσιν ἀτάφῳ σώματι ἐπβάλλειν αὐτῷ γῆν [2]. Εἶναι δ' ἄξιον παρατηρήσεως οἷς ἡ τοιαύτη ἱεροτελεστία ἣν οὐδεὶς Ἕλλην ἱερεὺς παραλείπει κατὰ τὸν ἐνταφιασμόν, δὲν κυρώθη ὑπὸ τῆς ἐκκλησίας, διότι οὐδεμία αὐτῆς μνεία γίνεται ἐν τῇ νεκρωσίμῳ ἀκολουθίᾳ [3].

Ὁ Κύριος Edward Tylor ὅστις μετὰ θαυμαστῆς πολυμαθείας κατέδειξε τὴν ὕπαρξιν παραπλησίων ἐθίμων παρὰ λαοῖς τῆς Ἀσίας, τῆς Ἀφρικῆς, τῆς Ἀμερικῆς, τῆς Αὐστραλίας, ἐπφέρει πολλὰς εὐφυεῖς εἰκασίας περὶ τῶν δοξαστῶν αἵτινες παρέσχον ἀφορμὴν εἰς τὴν γένεσιν τῶν ἐθίμων ἐκείνων [4]. Παρ' ἡμῶν δ' οἱ ἱερεῖς καὶ τῶν λαικῶν οἱ λογιώτεροι, ἐφωτώμενοι περὶ τῆς ἐννοιας τοῦ ἐθίμου, ὅπερ ὑπολαμβάνουσι θρησκευτικὸν νόμιμον, ἀποκρίνονται ὅτι εἶναι συμβολικὴ παράστασις τῆς διαλύσεως τοῦ ἀψύχου σώματος εἰς τὰ στοιχεῖα, ἐξ ὧν εἶναι συντεθεμένον, τὴν γῆν καὶ τὸ ὕδωρ. Ἡ ἀληθὴς ὅμως ἔννοια αὐτοῦ εἶναι δυνατὸν νομίζομεν νὰ ἀνευρέθη διὰ

προφύλαξις ἀπὸ τῆς ἱεροσυλίας τῶν τυμβορύχων οὐδεμία δ' ἀνάγκη ὑπάρχει ν' ἀναζητήσωμεν ἄλλον.

[1] Γέν. iii. 19.

[2] Βλ. πρὸς τοῖς ἄλλοις Αἰλιανόν, Ποικ. ἱστ. v. 14.

[3] Καθ' ὅσον γινώσκομεν μόνον ἐν Γορτυνίᾳ τῆς Πελοποννήσου τηρεῖται μὲν ἡ ἄλλη ἱεροτελεστία, θὲν συνεθίζονται δ' ἡ ἐπίχυσις τοῦ ὕδατος καὶ τῆς λαγήνου ἡ θραῦσις.

[4] Tylor, *Primitive Culture*, 3rd ed. 1891. τ. i. c. 483-4.

The present Greek custom is to break clay vessels upon the grave, and also, as the remains pass out, in front of the dead man's house. Sometimes the same thing goes on along the whole road followed by the funeral. Nearly everywhere in Greece the instant the dead is lowered into the grave the officiating priest, while pronouncing the words, "*Dust thou art and unto dust shalt thou return*,"[1] pours water upon the grave from a vessel specially brought for the rite. This done the vessel is instantly broken while the priest flings with it upon the grave a handful of earth. The mourners and bystanders at a funeral all deem it their religious duty to throw earth upon the dead, saying "*May God forgive him* (or *her*)." Thus they, without knowing it, conform to the practice inculcated by immemorial custom upon the ancient Greeks, whereby they were bound to strew earth upon any whom they saw unburied.[2] It is noteworthy that this religious rite, which no Greek priest would think of omitting, has never received the sanction of the Church, and is nowhere mentioned or provided for in the funeral service.[3]

Dr. Edward Tylor, to whose remarkable learning we owe proofs of the existence of similar customs among various Asiatic, African, American, and Australian peoples, offers many well considered hypotheses to account for the firm footing of these customs in popular beliefs.[4] In Greece, when priests or enlightened laymen are questioned about the meaning of this custom which they adhere to as a religious rite, their answer is that it symbolizes the dissolution of the soulless body into earth and water, its component elements. I believe, however, that its real or whole meaning can best be inferred after comparison with beliefs and customs of a similar kind elsewhere. A careful scrutiny of these justifies the inference that this practice of

[1] Genesis iii, 19.

[2] See among others Ælian, *Var. Hist.* v, 14.

[3] The only place known to me where the pouring out of the water and the breaking of the vessel are omitted from the rite, otherwise punctiliously observed, is Gortynia, in the Peloponnesus.

[4] Tylor, *Primitive Culture*, 3rd ed. 1891, vol. i, 483 f.

τῆς ἀναβολῆς πρὸς ἄλλα παραπλήσια καὶ τὰς συναφεῖς αὐτοῖς δοξαστάς. Ἐξετάζοντες δὲ μετ' ἐξοπτάσεως ταῦτα, συνάγομεν ὅτι δύο ἦσαν αἱ κυρίαι ἰδέαι ἐξ ὧν προῆλθε τὸ ἔθιμον τῆς θραύσεως τῶν ἀγγείων. Α'. Ἡ ἰδέα ὅτι πᾶν τὸ χρησιμεῦσαν πρὸς καθαρμοὺς πρέπει νὰ καταστραφῇ, ὅπως μὴ βεβηλωθῇ δι' ἄλλης χρήσεως, καὶ μειωθῇ οὕτως ἡ τῶν καθαρμῶν ἐνέργεια· καὶ Β' ὅτι τἀφιερωμένα εἰς τοὺς νεκροὺς πρέπει ἐπίσης νὰ καταστρέφωνται ὅπως ἐξασφαλίζηται τῆς ἀφιερώσεως ὁ σκοπός, ὅστις θὰ ἐματαιοῦτο ἂν τυχὸν ἐγίνετο ἄλλη τις χρῆσις αὐτῶν. Ὡς δὲ τὰ ἐπὶ τοῦ τάφου ἐναγιζόμενα ἔμψυχα ἐπετίθετο ὅτι διὰ τοῦ θανάτου αὐτοῦ καθίσταντο ὑπηρετικὰ τῷ τιμωμένῳ νεκρῷ, οὕτω καὶ τὰ σκεύη ἐπίσης ὑπολαμβανόμενα παρὰ τοῖς κατὰ φύσιν λαοῖς, πρέπει νὰ καταστραφῶσι, ἵνα χρησιμεύσωσιν αὐτῷ, ἀνεπτήδεια ὄντα πρὸς πᾶσαν ἄλλην χρῆσιν.

Ὡς πρὸς τὸ πρῶτον παρατηροῦμεν ὅτι καὶ νῦν, καθὼς τὰ πάλαι, συνεθίζονται καθαρμοὶ κατὰ τὰς κηδείας, καὶ ἐν μὲν τοῖς ἀρχαίοις χρόνοις οἱ ἐπὶ τὴν οἰκίαν τοῦ πενθοῦντος ἀφικνούμενοι ἐκαθαίροντο κατὰ τὴν ἔξοδον περιρραινόμενοι ὕδατι τοῦτο δὲ προὔκειτο ἐν ἀγγείοις κεραμείῳ ἐξ ἄλλης οἰκίας κεκομισμένον, τὸ δ' ἀγγεῖον ἐκαλεῖτο ἀρδάνιον[1]. Νῦν ἐν πλείστοις Ἑλληνικοῖς τόποις ἡ κάθαρσις γίνεται κατὰ τὴν ἐπάνοδον ἀπὸ τῆς κηδείας, συνισταμένη εἰς νίψιν τῶν χειρῶν τῶν μετασχόντων αὐτῆς, ἥτις ὡς ἐπὶ τὸ πλείστον γίνεται ἐν τῇ οἰκίᾳ τοῦ νεκροῦ[2]. Ἐν Κύπρῳ δὲ κατ' ἐξαίρεσιν νίπτουσι τὰς χεῖρας ἐπ' αὐτοῦ τοῦ

[1] Πολυδεύκης, η', 65.—Σχολ. Ἀριστοφ. Νεφ. 838: «Ἔθος ἦν μετὰ τὸ ἐκκομισθῆναι τὸ σῶμα καθαρμοῦ χάριν ἀπολούεσθαι τοὺς οἰκείους τοῦ τεθνεῶτος.» —Ἡσύχιος, λ. ἀρδάνιον· «τὸ ἀρδάνιον ἐτίθετο πρὸ τῆς θύρας τῆς οἰκίας.» Ἀριστοφάν. Ἐκκλησιάζ. 1033.—Βλ. καὶ Hermann-Blümner, *op. cit.* p. 365.—Περὶ ὁμοίων καθαρμῶν παρὰ Ῥωμαίοις βλ. Bekker, *Gallus*, τ. iii. c. 378.

[2] Κοραῆ, Ἄτακτα, τ. β. c. 404 κέ.—Ἰω. Πρωτοδίκου, Περὶ τῆς παρ ἡμῖν ταφῆς, Ἀθ. 1860, c. 13.—Ὁ ἐν Κωνσταντινουπόλει Ἑλλ. φιλολ. σύλλογος, τ. ιθ'. c. 139 (ἐν Τσεσμὲ τῆς Μικρᾶς Ἀσίας).—Ἐξ ἰδίων δὲ πληροφοριῶν γινώσκομεν ὅτι τοῦτο συνειθίζεται καὶ ἐν Γορτυνίᾳ, Ἀθήναις, Τριχωνίᾳ καὶ ἔν τισι τῶν Κυκλάδων.—Ὁμοίως ἔν τισι τῶν χωρίων τῆς Γαλλίας, οἱ ἐπανερχόμενοι ἐκ κηδείας, νίπτουσι τὰς χεῖρας, τὸ δὲ μάκτρον δι' οὗ πάντες σπογγίζονται ῥίπτουσιν εἰς τὴν στέγην (Noel, *Coutumes, mythes, et traditions des provinces de France*, c. 94). Ὅθεν καὶ ἐνταῦθα

breaking vessels is based upon two leading notions or preoccupations. (*a.*) That everything used in the ritual of purification ought to be destroyed lest the efficacy of the purificatory act be annulled through the profane use afterwards of things employed in its performance. (*b.*) That objects given to the dead must be destroyed, to guard against the possibility of their use for other purposes which annuls their dedication to the dead. Just as animals sacrificed upon graves are believed by primitive man to become, by their death, serviceable to the departed, so all chattels (which were also naïvely endowed with a life of their own) must perish by fracture or mutilation of some kind in order to serve the dead man's purposes, becoming through such mutilation unfit for living use.

With regard to (*a*), the first of these notions, we observe that now, as of old, purifications are a part of the funeral ritual. Among the ancients all who visited the house of mourning, were purified on issuing out of it by water, which was sprinkled upon them out of an earthen vessel brought from another house. This vessel was called *ἀρδάνιον*.[1] Nowadays, in a great many parts of Greece, this purification takes place after the funeral is over, and for the most part its rites are observed in the house of the dead, whither the mourners return.[2] In Cyprus, by way of exception, the washing of the hands takes place over the open

[1] *Pollux*, viii, 65. *Scho. in Aristoph. Nub.*, 838: "It was a custom after the dead had been borne to the grave for his whole household to wash themselves by way of purification. *Hesychius*, s. v. *ἀρδάνιον*: the vessel of purification (*ἀρδάνιον*) was placed in front of the house. Aristophanes, *Ecclesiazousae*, 1033. See also Hermann-Blümner, *op. cit.*, p. 365. For equivalent purificatory rites at Rome, see Bekker's *Gallus*, vol. iii, p. 378.

[2] Koraë's *Miscellanies*, vol. ii, p. 404ff. J. Protodikos, *Our Funeral Rites*, Athens (1860), p. 13. Publications of the *Greek Philological Association* at Constantinople, vol. xix, p. 139, mention the ritual at *Tzesme* in Asia Minor. I know from private sources that this is the ritual observed at Gortynia, Athens, Trichonia, and in several of the Cyclades. The same holds good in certain districts of France; people on returning from a funeral wash their hands, and the towel used to wipe them is summarily disposed of (Noël, *Coutumes, mythes et traditions des provinces des France*, p. 94). Here again we can discern anxiety to prevent any profane employment of what has served for a rite of purification.

τάφου, θραυσμένων εἶτα τῶν λαγήνων τοῦ ὕδατος καὶ τοῦ πρὸς ἄλλον σκοπὸν νομιζομένου ἐλαιοδόχου ἀγγείου [1].

Ἐν Αἴνῳ δὲ τῆς Θράκης νίπτονται ἐπὶ τοῦ μνήματος πάντες οἱ συνοδεύσαντες τὴν κηδείαν, τοῦτο δὲ ποιοῦσιν ὡς λέγουσιν «ἵνα μὴ βλέπωσι τὸν νεκρὸν καθ' ὕπνον [2].» Σαφῶς δ' ἐμφαίνεται ἡ ἔννοια τοῦ καθαρμοῦ ἐν τοῖς Ἀρκαδικοῖς ἐθίμοις τῆς θραύσεως τῶν ὑδριῶν κατὰ τὴν διάβασιν τῆς νεκρικῆς πομπῆς, ἣν ἀλλαχοῦ ἀλλῶς ἐξηγοῦσιν ὡς κατωτέρω θὰ ἴδωμεν. Ἐν τοῖς πλείστοις χωρίοις τῆς Ἀρκαδίας καὶ ἐν αὐτῇ τῇ Τριπόλει λέγουσιν ὅτι «ἅμα προσπεράσῃ τὸ λείψανο, πρέπει ἀμέσως νὰ πάρῃς ἕνα κανάτο ἢ νιὰ (=μίαν) στάμνο ἢ νιὰ λαῆνα (=λάγηνον) γεμάτη νερὸ καὶ νὰ τὸ χιούσῃς ἀπὸ τὴ νιὰ ἄκρη τοῦ δρόμου ἀς 'ς τὴν ἄλλη ἢ χάμου 'ς τἀγκωνάρι τοῦ σπιτιοῦ σοῦ ἢ μβπροστὰ 'ς τὴν πόρτα σοῦ μὲ οὖλο τἀγγειὸ ἢ μέσα 'ς ταῖς τέσσεραις ἀγκωναῖς τοῦ σπιτιοῦ καὶ νὰ σπάσῃς ταγγειὸ καὶ νὰ εἴπῃς: Διὸς (=θεὸς) σ' χωρέσ' τονε τὸ κακό του νὰ μὴ μᾶς βρῇ.» Ἐνίοτε οἱ δεισιδαιμονέστεροι χύνουσιν ὅλον τὸ ὁπουδήποτε τῆς οἰκίας ὑπάρχον ὕδωρ, ἐὰν τύχῃ καὶ διέλθῃ λείψανον πρὸ τῆς οἰκίας, διότι ἐν τοιαύτῃ περιπτώσει «τὸ νερὸ εἶναι θράσιο (=θρασύ), ἤτοι ἀκάθαρτον, ἄχρηστον, μίασμα τῆς οἰκίας, καὶ πρέπει διὰ τοῦτο νὰ χυθῇ ἀμέσως, ἵνα καθαρισθῇ ἡ οἰκία, «γιατὶ σκουληκιάζει τὸ νερό» ὅταν διέλθῃ τὸ λείψανον. Ἐπίσης χύνουσι τὸ ὕδωρ «γιὰ τὸ καλὸ» ἢ «γιὰ νὰ παστρεύτῃ τὸ σπίτι [3].»

Ἐκ δὲ τῆς δευτέρας τῶν ἀναγραφείσων ἰδεῶν ἀπορρέουσι πολλαὶ συνήθειαι μαρτυροῦσαι τὴν πεποίθησιν τοῦ λαοῦ, ὅτι τὸ ἐν ταῖς θραυσμέναις λαγήνοις ὕδωρ εἶναι πρωπριόμενον διὰ τὸν νεκρόν, καὶ ὅτι ἡ χύσις τοῦ ὕδατος εἰς τὴν γῆν καὶ ἡ καταστροφὴ τοῦ περιέχοντος αὐτὸ ἀγγείου θεωροῦνται ὡς οἱ καταλ-

διαβλέπομεν προσπάθειαν πρὸς παρανάλυσιν τῆς βεβήλου χρήσεως τοῦ χρησιμεύσαντος εἰς καθαρμόν.

[1] Γ. Λουκᾶ, Φιλολογικαὶ ἐπισκέψεις, Ἀθ. 1874, σ. 98.—Ἀθ. Σακελλαρίου, Κυπριακά, Ἀθ. 1890, τ. i. σ. 738.

[2] Ὁ ἐν Κωνσταντινουπόλει Ἑλλ. φιλολ. σύλλογος, τ. ιἡ. σ. 549.

[3] Κατ' ἀνακοίνωσιν τοῦ Ἀρκάδος κ. Α. Σ. Ἀβανιτοπούλου.

grave. The water-jars are then immediately broken, together with the oil-jar brought there for a different purpose.[1]

At Aenos in Thrace all who have followed the procession to the grave wash themselves there. The reason they give for so doing is "In order not to see the dead man in their dreams."[2] But an idea of purification is obviously embodied in this custom as well as in the Arcadian custom of breaking jars while the funeral goes by. This is variously explained in various localities as will be shewn below. In most Arcadian country places, and even in Tripolitza itself, the injunction is "As soon as the remains come by your door, take a jug full of water, or a jar or some vessel, straightway empty this, pouring it from one end of the street to the other, or else empty it on the cornerstone of your house or pour it out in front of your door, or halfway between the four corners of your house. Break the vessel thus emptied and say, "*May God forgive him* (or *her*) *and may the harm that fell on him not find us.*"

Sometimes those who are especially superstitious throw out all the water that may be stored anywhere in the house when a corpse happens to be borne past, and the reason given in such a case is "that the water is rough," that is impure, useless,—a pollution to the house, and must therefore immediately be thrown away that the house may be purified, "for water breeds worms," if left in a house after a corpse has gone past. Or again they account for their pouring out the "water because it makes things right," or "to get the house clean."[3]

From (*b*), the second of the two notions mentioned above, spring various customs which bear testimony to the fixed popular belief that the water held by these broken vessels was an offering to the dead, and that the pouring out of it on the earth, together with the breaking of the vessel holding it, is the most effectual way for bringing the dead into possession of their own. The

[1] G. Louka, *Philological Essays*, Athens (1874), p. 98. A. Sakellarior, *Cypriote Studies*, Athens (1890), vol. i, p. 738.

[2] See vol. viii, p. 549, of the *Proceedings of the Greek Philological Society* of Constantinople.

[3] On the authority of Mr. A. S. Abanitopoulos, an Arcadian.

λιλότατοι τρόποι ὅπως λάβῃ τὸ προσφερόμενον ὁ νεκρός. Ὡς καὶ παρὰ τοῖς πλείστοις λαοῖς, ἀκμαία διατηρεῖται καὶ παρὰ τοῖς Ἕλλησιν ἡ δοξασία περὶ ἐπιβιώσεως τῶν νεκρῶν ἐπὶ τῆς γῆς καὶ ἡ παρεπομένη τῇ δοξασίᾳ ταύτῃ συνήθεια τῆς προφορᾶς τροφῶν εἰς αὐτούς. Πολλαχοῦ τῆς Ἑλλάδος ἐξακολουθοῦσιν ἐναγίζοντες τοῖς νεκροῖς, ὡς ἐν ἄλλῳ τόπῳ διαλαμβάνομεν [1]. Ἐνταῦθα δ' ἀρκούμεθα ν' ἀναφέρωμεν ὅτι ἐν ταῖς πλείσταις Ἑλληνίκαις χώραις ἐπὶ τρία ἡμερονύκτα ἀνάπτουσιν ἐν τῷ δωματίῳ ὅπου ἐξεψύχησεν ὁ νεκρὸς ἀκοίμητον λύχνον καὶ παραθέτουσιν ἄρτους καὶ λάγηνον πλήρη ὕδατος [2]. Ἐν Κρήτῃ ἀποτίθεται ἐπὶ τοῦ τάφου λάγηνος ὕδατος καὶ ἀφίεται ἐκεῖ ἡμέρας τεσσαράκοντα διότι δοξάζουσιν ὅτι κατὰ τὸν χρόνον τοῦτον ἡ ψυχὴ τοῦ νεκροῦ περιφερομένη εἰς τοὺς τόπους εἰς οὓς ζῶν παρευρέθη πίνει ἐκ τοῦ ὕδατος ἐκείνου ἐπανερχομένη τὴν ἑσπέραν [3]. Ἐνιαχοῦ ὅμως λησμονηθείσας τῆς ἐννοίας τοῦ ἐθίμου ἐπλάσθη ἄλλη δικαιολογία, ὅτι δηλαδὴ τὸ ἀγγεῖον τοῦ ὕδατος ἐν τῷ οἴκῳ τοῦ θανόντος χρησιμεύει ὅπως πέσει μέσα ὁ διάβολος, ὁ ὁποῖος «γίνεται σὰν μῦγα καὶ ἔρχεται νὰ πάρῃ τὴν ψυχὴν τοῦ πεδαμίου [4].» Ἢ ὅτι διὰ τοῦ κρότου τῶν θραυσμένων ἀγγείων ἐκδιώκονται οἱ δαίμονες, ὅσοι περιτρέχουσι ζητοῦντες νὰ σύρωσι διὰ τῆς βίας εἰς τὴν κόλασιν τὴν ψυχήν [5]. Ἐν Τριπόλει δὲ καὶ ἐν πολλοῖς χωρίοις τῆς Μαντινείας πιστεύουσιν ὅτι ταγγεῖα θραύονται πρὸς ἐκφόβησιν τοῦ Χάρου καὶ ἀποτροπὴν αὐτοῦ. Συνειθίζουσιν ἐκεῖ κατὰ τὴν ἐκφορὰν τοῦ

[1] Παρθενών, Ἀθ. 1872, τ. ii. σ. 143.

[2] Χ. Μεγδάνου, Λύχνος Διογένους, 1818, σ. 273 (Μακεδονία). Ὅτι τὸ ἔθιμον τοῦτο κρατεῖ πολλαχοῦ τῆς Ἑλλάδος γινώσκομεν ἐξ ἰδίας ἀντιλήψεως.

[3] Bybilakis, *Neugriechisches Leben*, σ. 67.—Πανδώρα, 1876, τ. xvii. σ. 331.

[4] Κατ' ἀνακοίνωσιν τοῦ Κυρίου Γ. Δροσίνη.—Παραπλησία πρόληψις ἐπικρατεῖ πολλαχοῦ τῆς Γαλλίας, ὅπου κενοῦσι πάντα ταγγεῖα ἵνα μὴ πέσῃ εἰς τὸ ὕδωρ καὶ πνιγῇ ἡ ψυχὴ τοῦ τεθνεῶτος. (Βλ. *Mélusine*, τ. i. col. 97, 320, 456.)

[5] Ἀντωνιάδου Κρητικῆς, σ. 346–7.—Ὅμοια ἔννοια ἀποδίδοται καὶ εἰς τὴν θραῦσιν πηλίνων ἀγγείων τὸ Μέγα Σάββατον, ἥτις καὶ ἀλλαχοῦ μὲν συνειθίζεται, ἐξαιρετῶς δ' ἐν Κερκύρᾳ.

Greeks are as firmly convinced, as are many other peoples, that the dead have a further lease of life upon earth. Hence the custom of making offerings of food to them. These offerings are commonly made in Greece as I have recorded at length elsewhere.[1] Let it only be noted here that in many places a light is kept burning for three consecutive days and nights in the chamber of the departed where bread as well as a jar of water is kept in readiness.[2] In Crete a jar full of water is deposited at the grave, where it is left for forty days, the belief being that during all that time the departed soul wanders over the haunts where it lived, and returns every evening to drink of the water provided.[3] In some places, where the meaning of this custom has been lost sight of, other explanations have suggested themselves. The jar of water placed in the house of the dead is for the devil to fall into when "*he comes in the form of a fly to take off the soul of the dead.*"[4] Or else the noise of the breaking of the jar drives away the demons who hover around seeking violently to drag off the dead man's soul to torments.[5]

At Tripolis and in many Mantineian villages it is believed that the vases are broken to frighten Charon, and to keep him away. There it is customary for the more well-to-do to break a

[1] *Parthenon* (Athens, 1872), vol. ii, p. 143.

[2] Ch. Megdanou, *The Lantern of Diogenes*, 1818, p. 273, where Macedonia is spoken of. That this custom prevails widely in Greece I know from private sources of information.

[3] Bybliakis, *Neugriechisches Leben*, p. 67. *Pandora* (1876), vol. xvii, p. 331.

[4] This fact is kindly communicated by Mr. G. Drosines. An analogous presumption is made in many parts of France, where they empty all vessels in order that the soul of the departed may not run the risk of falling in and being drowned (see *Mélusine*, vol. i, col. 97, 320, 456).

[5] Antoniados, *Kreteïs*, p. 346 f. A similar significance is attached to the custom of breaking earthen pots as a part of the *Great Sabbath*. This is observed in many places, but most punctiliously at Corfu.

νεκροῦ νὰ θραύωσιν, οἱ μὲν εὐπορώτεροι καινουργῆ ὑδρίαν ἢ λάγηνον, οἱ δ' ἀπορώτεροι παλαιόν τι ἀγγεῖον ἢ ἁπλῶς κέραμον πρὸ τῆς θύρας τῆς οἰκίας, ἢ πρὸ τῆς θύρας τοῦ δωματίου ἐν ᾧ ἐτελεύτησεν ὁ νεκρός, ἢ ἐν ᾧ δωματίῳ ἐξελέχθη ἤτοι ἐν τῷ δωματίῳ τῶν εἰκονισμάτων. Τὸ ἀγγεῖον θραύει στενὸς συγγενὴς ἢ φίλος τοῦ θανόντος, συνηθέστατα δὲ γυνή, ἀλλὰ πρεσβῦτις, ἔχουσα ἡλικίαν ἄνω τῶν 50 ἐτῶν· εἰς νέον θὲν ἐπιτρέπεται τοῦτο διότι οἱ νέοι εἶναι ἀνίσχυροι ν' ἀντιμετωπίσωσι τὸν Χάρον («νὰ τὰ βαίουν μὲ τὸ Χάρο») ἢ,—ὅπερ ἀληθέστερον,—διότι φοβούμενοι ἐκδίκησιν τοῦ Χάρου, προτιμῶσι νὰ ἐκθέσωσιν ἐς αὐτὴν πρεσβύτην μᾶλλον ἢ νέον. Πιστεύουσι δὲ ὅτι ἡ θραῦσις τοῦ ἀγγείου, ἐκφοβοῦσα τὸν Χάρον, ἐξασφαλίζει τὴν ζωὴν τῶν ἄλλων. Καὶ ἐπιλέγουσι θραύοντες τὸ ἀγγεῖον «Ἕνανε μᾶς ἐπῆρες, μωρὲ Χάρο, νάντοτος!» (=ἰδοῦ αὐτός)—ἐνταῦθα θραύεται τὸ ἀγγεῖον—«ἄλλονε θὲν μᾶς παίρνεις!» ἢ «ὅπως σπάζει τὸ κεραμίδι, ἔτος, ῥὲ Χάρο, νὰ σπάσῃ τὸ κεφάλι σοῦ ἂν ξανάρθῃς!» (ἢ «ἂν ξανάμπῃς 'ς τὸ σπίτι μᾶς!») ἢ «σιδερένιοι νὰ εἴσαστε» (ἢ «νὰ εἴμαστε!») ἢ «Νὰ 'ναι σιδερένιοι οἱ πισινοί!» ἢ «Ἕνος ἐχάθη, οἱ ἄλλοι σιδερένιοι!» (ὑπονοεῖται «ἂς εἶναι»). Λέγουσι δ' ὅτι θραύουσι τὸ ἀγγεῖον «γιὰ νὰ σκιάζουνε τὸ Χάρο,» ἢ «Νάν τ' ἀκούσῃ ὁ Χάρος καὶ νὰ μὴν ξανάρθῃ,» ἢ «νὰ μὴ σώσῃ νἀρθῇ πλιὰ ὁ Χάρος,» ἢ «γιὰ νὰ μὴν ξανάρθῃ ὁ Χάρος,» ἢ «νὰ μὴ σώσῃ πλιὰ νἀρθῇ καὶ ἄλλη βολὰ 'ς τὸ σπίτι μᾶς,» ἢ «γιὰ νὰ μὴν τοῦ περνάῃ πλιά,» ἢ «νὰ ξεσπάσῃ τὸ κακὸ 'ς τὸ κεφάλι τοῦ Χάρου,» ἢ «γιὰ νὰ φύγῃ τὸ κακὸ ἀπὸ τὸ σπίτι μᾶς,» ἢ «γιὰ νὰ μὴ μᾶς ξαναίρῃ τὸ κακό,» ἢ «γιὰ νὰ ζήσουνε οἱ ἄλλοι,» ἢ «γιὰ νὰ μὴν πεθάνῃ ἄλλος,» ἢ «γιὰ νὰ μείνουνε οἱ ἀποσέλοιποι,» ἢ «γιὰ νὰ 'ναι οἱ ἄλλοι γεροί.»[1]

[1] Κατ' ἀνακοίνωσιν τοῦ Κ. Α. Σ. Ἀβανιτοπούλου, ἕτεροι τρόποι πρὸς ἐκφόβησιν τοῦ Χάρου κατὰ τὰς κηδείας συνειθίζονται οἱ ἐξῆς ἐν Ἀρκαδίᾳ· ἐνίοτε θραύουσι τὸ καλαμίδι ἢ καλάμι τοῦ ἀργαλειοῦ· κάλαμον μῆκος 1½ μεχρὶ 2 πήχεων, ἐπιλέγοντες: «τὸ καλάμι τὸ σπάσες, μωρὲ Χάρο, μὰ το σιδέρο θὰ μβορέσῃς,» ἢ «σιδερένιοι οἱ πισινοί.» Ἐνιαχοῦ δὲ τῆς Μαντινείας καὶ δὴ καὶ ἐν Τριπόλει κόπτουσιν ἐκ τοῦ σαβάνου μακρὰν λωρίδα, ἣν ἀναρτῶσι πρὸ τῆς θύρας τῆς οἰκίας ἢ εἰς τὴν δοκὸν τῆς στέγης (εἰς τὸ

new jar or jug on the occasion of a funeral, while the poorer people will break an old vessel or only a tile, before the house door, the door of the death chamber, or even inside the room where the body is laid out, which is the one where the holy pictures are kept. The vase is broken by some near relation or friend of the dead, in most cases by a woman. But she must be rather old, over fifty as a rule. No young person may do it, "since the young have not the strength to measure themselves against Charon," some say. Others put it more plausibly by saying that it is for fear of Charon's revenge that an old person is preferred to a young one. This breaking of a vase is believed to inspire Charon with fear and thus to preserve the lives of the survivors. While in the act of breaking they say, "Thou hast taken one from us, oh Charon, thou numbskull, here he is,"—then they break the vase—"none other shalt thou take!" Or again: "As this tile breaks, oh Charon, so be broken thy head if thou comest again" (or, "if thou enterest afresh this house of ours"). Or again: "May we (or 'you') be of iron"! Or, "one is lost, be the others as iron!" (*i.e.*, the others shall be as strong as iron). The accounts popularly given of this breaking of pots and potsherds is that they do it "to frighten Charon," or "that Charon may hear the noise and not return," or "that he may not come again to this house," or "that he may not have his will another time," or "that the harm may be upon Charon's head," or "that the harm may fly from our house," or "that the harm may not find us again," or "that the others may live," "that no one else may die," "that the survivors may bide where they are," or "may be lusty and strong."[1]

[1] I owe to Mr. A. S. Abanitopoulos the following record of Arcadian customs for terrifying Charon. Sometimes they break the rod of the loom which is from 1½ to 2 metres long, saying "this rod hast thou broken, Charon, thou numbskull, but iron shalt thou not break;" or, "may the survivors be as iron." In Tripolis, not to speak of parts of Mantineia, they cut long strips from the shroud and

Ἀλλὰ διὰ τὸ χεόμενον κατὰ γῆς ὕδωρ ζωηρὰν ἔχουσι τὴν συνείδησιν οἱ τὸ ἔθιμον τοῦτο τηροῦντες οἷς γίνεται διὰ νὰ δροσωθῇ ἡ ψυχὴ τοῦ νεκροῦ. Συνήθως ἡ λάγηνος τοῦ ὕδατος θραύεται παρὰ τὴν θύραν τῆς οἰκίας κατὰ τὴν ἔξοδον τοῦ νεκροῦ [1]. Ἐν Χίῳ δοξάζουσι μὲν συμφώνας πρὸς τοὺς θρήνους τῆς νεκρωσίμου ἀκολουθίας ὅτι ἐπιπονώτατον ἀγῶνα καββάλλει ἡ ψυχὴ χωρισμένη τοῦ σώματος, πρὸς ἀνακούφισιν δ' αὐτῆς ῥίπτουσιν εἰς τὴν ὁδὸν πήλινα ἀγγεῖα ὕδατος ὅταν ἐξαχθῇ τὸ λείψανον ἐκ τῆς οἰκίας, πλὴν δὲ τούτου πολλοὶ τῶν φίλων καὶ συγγενῶν ῥίπτουσι τοιαῦτα καὶ ὅταν διέρχηται ἡ πομπὴ πρὸ τῆς οἰκίας τῶν, διὰ νὰ δροσίσουν «τὴν λαύρα τῆς ψυχῆς» τοῦ νεκροῦ [2]. Ἐν Κύπρῳ δὲ κατὰ τὴν ἐκκομιδὴν τοῦ νεκροῦ χύνουσιν ὕθεν καὶ ἂν διέρχηται ἡ νεκρικὴ πομπὴ πρὸς ἀνακούφισιν τῆς ψυχῆς τοῦ νεκροῦ ὕδωρ καθαρὸν ἐκ πηλίνων ἀγγείων, ἅπερ ἀμέσως ῥίπτοντες χαμαὶ συντρίβουσι [3]. Συνειθίζουσι προσέτι αὐτόθι νὰ ἐκχέωσιν εἰς τὰς ὁδοὺς κάτοπιν τοῦ νεκροῦ καὶ ὅλον τὸ ἐν ταῖς ὑδρίαις τοῦ οἴκου ἀποτεταμιευμένον ὕδωρ πιστεύοντες ὅτι ἔχει μιανθῇ διότι ἀπέπλυνεν ἐν αὐτῷ τὴν αἱμοστάγη μάχαιραν, δι' ἧς ἀπέκτεινεν τὸν νεκρὸν ὁ Χάρων ἢ ὁ ψυχοπομπὸς Ἄγγελος [4].

Δηλονότι παρέχεται οὕτω καὶ ἄλλη, μυθολογικὴ αὕτη, ἐξήγησις τοῦ ἐθίμου, ἥτις ὅμως ἐπισκοτίζει τὴν κοινῶς κρατοῦσαν δόξαν, ὅτι τὸ ὕδωρ εἶναι προσφορὰ πρὸς τὸν νεκρὸν καὶ ὅτι ἐπομένως ἡ θραῦσις τῶν ἀγγείων σκοπεῖ τὴν ἐξασφάλισιν τῆς ὑπὸ τοῦ νεκροῦ χρήσεως τῆς προσφορᾶς ταύτης.

πάτερο) «γιὰ νὰ δέσουνε τὸ Χάρο ἂν ξυνάρθῃ,» πιστεύοντες ὅτι ὁ Χάρων, ἂν θελήσῃ νὰ ἐπανέλθῃ ὅπως ἀποκτείνῃ ἄλλον τινὰ ἐκ τῆς αὐτῆς οἰκίας, βλέπων τὸ προπριομένον πρὸς δέσιμον αὐτοῦ σχοινίον θὰ φοβηθῇ καὶ θὰ φυγῇ.

[1] Pouqueville, *Voyage de la Grèce*, 1827, τ. vi. σ. 147.—Πρωτόδικος, *op. cit.* σ. 13.—Τὸ ἔθιμον παρετηρήθη ὑπ' ἐμοῦ ἐν Ἀθήναις καὶ πολλαχοῦ τῆς Πελοποννήσου.

[2] Κ. Κανελλάκη, Χιακὰ Ἀναλέκτα, Ἀθήν. 1890, σ. 338.

[3] Σαγγάριος, *op. cit.*

[4] Λουκᾶς, *op. cit.* σ. 97.

As to the water spilled upon the ground, all who keep up this observance are absolutely firm in their faith that it refreshes the departed. Usually a vessel is broken at the house door as the body is carried out.[1] On the island of Chios there is a literal understanding of the lamentations which form part of the funeral service attributing to the soul feelings of poignant agony during the struggle which parts it from the body. By way of relief they empty jars of water upon the ground at the moment when the funeral moves away from the house. Moreover many friends and kinsmen of the departed, when the procession passes their doors, empty vessels of water into the street in order to ease the burning pains of the dead.[2] In Cyprus, all along the road taken by the funeral pure water is thrown upon the ground for the relief of the dead, and the jars containing it are flung down and broken when emptied.[3] Another Cypriote custom requires that all the water standing in houses passed by the funeral should be thrown away. The belief is that Charon or the Summoning Angel of the dead (ἄγγελος ψυχοπομπός)[4] has polluted all such standing water by washing in it the blood-stained knife used to slay the dead.

This mythological explanation of the custom does not, however, supersede the generally prevailing belief that the water is an offering to the dead and that the breaking of the vessels assures the sole use of the offering to the departed.

hang them over the door or from the main roof-beam, in order to bind Charon with it, if he tries to come again. They believe instead of making a new victim in the house, he will see this and begone in fear and trembling.

[1] Pouqueville, *Voyage de la Grece*, 1827, vol. vi, p. 147. Protodikos, *op. cit.*, p. 13. I have myself witnessed this observance at Athens and in many parts of the Peloponnesus.

[2] K. Kanellakes, *Chiote Miscellanies*, 1890, p. 338.

[3] Sangarios, *op. cit.*

[4] Loukas, *op. cit.*, p. 97.

The CAVE PAINTINGS *of* AUSTRALIA, *their* AUTHORSHIP *and* SIGNIFICANCE. By the REV. JOHN MATHEW, M.A., B.D.

[WITH PLATES IV–VII.]

THE art of painting has been so little practised by the aborigines of Australia, that to say they were ignorant of it altogether would not be far from the truth. Some of them after contact with Europeans have given evidence of considerable imitative power, but usually native pictorial art has not risen higher than rude conventional sketches of men, kangaroos, emus, turtles, snakes and weapons, done mostly in charcoal and occasionally cut out on trees or graven on rocks. The linear designs scratched on the inner surface of opossum rugs or carved on weapons, and sometimes coloured red, black or yellow are of the simplest patterns. But at a few places, very widely apart, specimens of art have been discovered immeasurably superior to the ordinary aboriginal level. The only localities, so far as I can learn, where this higher artistic skill has been exhibited, are the following: Depuch Island, one of the Forestier group, on the west coast of Australia, in lat. 20° 37′ S. and long. 117° 41′ E.; Cape York Peninsula; Clack's Island, near Cape Flinders on the north-east coast of Queensland; Chasm Island in the Gulf of Carpentaria, and the Glenelg and Prince Regent Rivers, not far inland, on the north-west coast of Australia. Mr. J. Bradshaw informs me that Lieut. Oliver, of H.M.S. "Penguin," while on a survey expedition on the west coast of Australia found cave drawings on Feint Island, near Bigge Point (lat. 14° 30′ S. long. 125° 3′ E.), and took some sketches. I do not know their character.

In three places, a few miles distant from each other, Mr. Giles found paintings of inferior workmanship and accompanied by the almost universal hand-prints. He noticed characters like the Roman numerals VI. painted red, and dotted over with spots. His discovery was made a little to the north of Lake Amadeus, near the heart of Australia, and the description he has given of the style of art, suggests that the artists were of the same race as those who elsewhere have left such memorials of their presence.

The paintings on Depuch Island are numerous, but, judging from the sketches made by their discoverer, Capt. Stokes, they are much inferior to the other groups in point of subject and treatment; they represent animals chiefly. In one sketch there is a rude attempt at delineating a corroboree. The artists have

been satisfied if what they intended for human figures have been recognizable as such.

In the Cape York Peninsula, the northernmost part of Queensland, Mr. Norman Taylor, when exploring, "found a flat wall of rock on which numerous figures were drawn. They were outlined with red ochre, and filled in with white. The figure of a man was shown in this manner, and was spotted with yellow."[1]

At Clack's Island, paintings were discovered by Mr. Cunningham, 23rd June, 1821, when he accompanied King's Survey Expedition. "They were executed upon a ground of red ochre (rubbed on the black schistus), and were delineated by dots of a white argillaceous earth which had been worked up into a paste." They represented "tolerable figures of sharks, turtles, etc." Besides being outlined by the dots, "the figures were dotted all over with the same pigment, in dotted transverse belts;"[2] more than one hundred and fifty figures had been thus executed.

Those at Chasm Island were discovered by Flinders, 14th January, 1803. They were painted with charcoal, and some kind of red paint on white rock as a back ground, and represented porpoises, turtles, kangaroos, and a human hand. Mr. Westall found, at the same spot, "the representation of a kangaroo, with a file of thirty-two persons following after it. The third person of the band was twice the height of the others, and held in his hand something resembling the waddy of the natives of Port Jackson."[3] The human figures were nude.

The most notable of the cave paintings are those found by Capt. Grey (now Sir George Grey),[4] in March, 1838, on the Glenelg River, near the north-west coast of Australia, in long. 125° 9′ E., lat. 15° 57½′ S., and some near the same locality, by Mr. Joseph Bradshaw, in the beginning of 1891, at Prince Regent River, in long. 125° 36′ E., lat. 15° 40′ S., or some 37 miles north-east of Grey's.

There can be little doubt that all these groups of unique specimens of art—the Depuch Island group is somewhat uncertain—were produced by people of one and the same race, who were foreigners relatively to Australia. One singular characteristic indicates a unity in style of execution, viz., the decoration of the body of certain of the figures with dots. This was a feature

[1] R. Brough Smyth: "Aborigines of Victoria," vol. i, p. 292.
[2] King's "Voyages to Australia," vol. ii, pp. 25 *et seq.*
[3] Flinders' "Voyages to Terra Australia," vol. ii, p. 188.
[4] Sir George Grey: "Journal of two expeditions of discovery in North-Western and Western Australia, 1837-9."

of some of the work seen by Grey, Taylor, Cunningham, and Giles respectively.

I shall now restrict my observations to the two most important and wonderful paintings among Grey's discoveries, and the four discovered and sketched by Mr. Bradshaw. Figure I. of Grey's was the upper part of a nude (or apparently nude) human form[1] embracing full face, arms and trunk; the mouth not delineated, or probably worn off the painting. This figure was executed upon the sloping roof of a natural cave, the entrance to which was 5 feet in height. For the sake of effect the background had been coloured black. The total length was 3 feet $6\frac{3}{4}$ inches, the greatest breadth 3 feet $1\frac{1}{2}$ inches, the colouring was in the most vivid red and white, the eyes being black, a halo of light red was depicted round the head, its continuity being interrupted by the neck; triple parallel dotted lines of white crossed the halo from the head outwards at regular intervals. All round the halo, rising from its outer rim, there were wavy tongues of flame done in a darker red. The outline of the halo was dark red, that of the eyes yellow, that of the nose red. The trunk of the body, from the level of the armpits down to about the waist, was marked irregularly all over with red ticks, bearing a strong resemblance to Sumatran writing. (Plate IV., fig. 1.)

Grey's fig. II. (Plate IV., fig. 2) is also of a human form, and done on the roof of another cave. It is clad in a red robe, reaching from the neck to the ankles, and having tight-fitting sleeves. The total length of this figure is 10 feet 6 inches; the face looks right forward; the background of the face is white, the mouth being indicated by a red streak. No nose appears, the probability is that the paint has been worn off by the weather. The eyes are outlined with yellow, which is bordered with a thin red line. Surrounding the face, there is a broad band of yellow outlined with red, and outside of this is a broader white band or halo also outlined with red, and interrupted at the neck. The hands and feet are coloured dark red. The figure stands nearly in the military attitude of "Attention," the hands, however, being separated a little from the sides. Immediately over the head on the outer halo or head-dress are six marks, placed in a horizontal line at close regular intervals, bearing a general resemblance to plain Roman letters. To the right of the figure are three perpendicular rows of small irregular rings, seventeen in the line next the figure, twenty-four in the middle line, and twenty-one in the outer line. To the left and close to the shoulder are two marks which may have been intended for

[1] The artist may have meant to represent this figure clothed with a tight-fitting tunic.

similar rings. The upper one is like a crescent with convex side up the other like a horizontal ellipse, the upper left (to the observer) quarter wanting. For a view of coloured prints of these and other paintings seen by Grey, I would refer to his North-West and West Australia, vol. i., pp. 201 *et seq.* The colours employed in both Grey's and Bradshaw's discoveries were red, blue, yellow, black and white. In Bradshaw's there was also brown.

Various conjectures have been made regarding the origin of this group, some of them rather wild. These paintings have been referred to Phœnicians, Spaniards, Portuguese, and Hindus respectively. Mr. R. Brough Smith thought that with the exception of Grey's fig. I., the authorship of which he considered doubtful, they were the work of natives of Australia "unassisted by any knowledge gained by intercourse with persons of a different race."[1] As long ago as 1846, Mr. Hall sought to identify fig. I. as Amoun, Cronus or Jupiter.[2] He says that one Hindu who was shown a sketch of it, called it Kons; another called it Koodar or Kadar; and a Victorian Black called it Pundyil, a deity of the Victorian natives. On page 36 Mr. Hall identifies this figure with the Hindu Siva; his conclusion, I believe, is correct, although hardly justified by his premises. Now, however, we have got fresh light in Mr. Bradshaw's discoveries, and when viewed in conjunction with them, it is all but certain that this figure is intended to represent one of the Hindu Triad, viz., Mahadeva or Siva (the Destroyer Time), which is sometimes portrayed with a halo round the head.

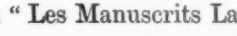
With regard to Plate IV., fig. 2, being much struck with the resemblance which the marks on the head-dress bore to the alphabets of Sumatra, I have tried to decipher them, and I believe the result is successful. By comparing the characters on the painting with the specimens of Sumatran writing, given in V. D. Tuuk's "Les Manuscrits Lampongs," I made out the first four letters to spell D AI B AI; then I found from Marsden's "History of Sumatra"[3] that the Battas of Sumatra applied the name Daibattah to one of their deities, and that the Cingalese have a cognate name *dewiju*; the Telingas of India employ the word *daiwunda*, the Baijus of Borneo, *dewattah*, etc.—all to designate a divine being. I ultimately succeeded in deciphering the whole inscription to read DAIBAITAH. The following considerations leave, I think, no room for doubt as to the correctness of my

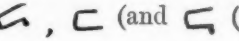
[1] "Aborigines of Victoria," vol. i, p. 289.
[2] "Remarks on the Probable Origin and Antiquity of the Aboriginal Natives of New South Wales."
[3] "History of Sumatra," p. 290.

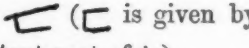
interpretation; the authenticated letters are from V. D. Tuuk's "Les Manuscrits Lampongs." Assuming that Grey copied the painting with perfect accuracy, and that it was in perfect preservation, the characters are:—

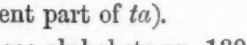
My interpretation is *D AI B AI TA H*

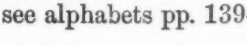
are *unquestionably* corresponding forms in "Les Manuscrits Lampongs."

Forms of *da* are (and  (like above) on pp. 56 and 101).

Forms of *ta* are  (is given by other writers, therefore is the persistent part of *ta*).

 is the common for *ba*, see alphabets pp. 139–142.

 is given as *ai* in alphabets of Part V. of MS. *A*.

In alphabet drawn from Part I. of MS. A (p. 139) there are two forms for "h," of which  placed on the right of another consonant represents *final* "h," and like the vowels with which it seems to be classed is smaller than the consonants. The character as written will be seen in Part I. of MS A, and in some cases the lines are almost touching at the angle.

A considerable amount of information is available about this mythical person. The Battaks (or Battas) of Sumatra "believe in the existence of one supreme being, whom they name Debati Hasi Asi. Since completing the work of creation they suppose him to have remained perfectly quiescent, having wholly committed the government to his three sons, who do not govern in person, but by Vakeels or proxies."[1] The proxies also get the title of Debata with a modifying word, so that it is the generic name for *deity*. It seems to me that the myth of Daibaitah and his three sons, is an accommodation of the Hindu supreme divine essence Narayana with the triad, derived from him or sometimes represented as his modes Vishnu, Brahma, and Siva. The root of Daibaitah and its variants is evidently the Sanskrit Deva (*Cf.* Daiva, fate), and may be compared with *divus* and *divinity*.

Mr. Bradshaw saw fifty or sixty pictures or scenes. In a paper read before the Royal Geographical Society of Australia, 10th September, 1891, when referring to the cave paintings, he says, "These sketches seemed to be of great age, but over the

[1] Coleman's "Mythology of the Hindus," p. 364 *et seq.*

surface of some of them were drawn in fresher colours smaller and more recent scenes and rude forms of animals." "In one or two places we saw alphabetical characters somewhat similar to those seen by Sir George Grey."

Of Bradshaw's discoveries, Group I. (Plate V., fig. 1) comprises five human figures coloured brown, a snake and kangaroo coloured red, and legend in characters manifestly of the same type of alphabet as those in Grey's painting. There are are also in red two personal ornaments detached: one of these consists of four concentric circles somewhat compressed horizontally, with three discs of like shape, one in the centre and one at each side of the outermost ring; the other is a band in the shape of half an ellipse, each end terminating in a round disc. There are four spikes projecting from the upper part of this figure, and five others from the rounded end. This is no doubt a sketch of an elaborate and massive earring, as will be shown further on.

The human figures have long caps on the head.[1] Three of them have yellow collars evidently representing gold. One has a girdle with tassels at each side, and armlets at the elbows, from which there are tassels depending. The limbs are poorly executed, both as regards shape and proportion. Total length of scene, from right to left, 12 to 15 feet; greatest height, 6 to 9 feet.

Group II. (Plate V., fig. 2) represents two female figures done in brown. The one is in erect posture, the head turned to one side so as to show the face in profile. The full front of the body is shown, the arms being extended sideways. From the knees downwards has not been sketched. There are armlets at the elbows, and tassel-like ornaments hanging down from the head. The other figure is in an attitude of swimming or perhaps supplication. The side of the body is seen, the hands being extended in front. The figure terminates a little below the waist. Both figures have on long, heavy-looking caps. A crocodile-coloured red stretches across the picture behind the human figures, its length is about 10 feet, the tail and feet are wanting. The erect female figure is about 5 feet in height.

Group III. (Plate VI., fig. 1) contains a bright red figure rudely representing the upper part of a human form. The head is surmounted by nine detached yellow rays. It has three arms or flippers, two red ones where arms would naturally be placed, and extending almost at right angles from the trunk; the third arm is brown, it reaches upwards and outwards from the left side,

[1] What appear to be caps may really be in some of the instances the style of coiffure like that of the natives of Timor Laut, who dress the hair to hang down in a cataract. *Cf.* Forbes' "Eastern Archipelago," p. 308.

and at its extremity is a skull coloured brown, with eye sockets and mouth left blank. The body is enlarged and rounded at the lower extremity which rests on the back of a large serpent, the head of which rises and projects outwards on the left side of the main figure just under the death's head. The serpent's mouth is open, its eyes left blank, the head and neck are coloured yellow, the rest of the body a dark red, the colours meeting in a zigzag line with acute deep angles. In front of the rather amorphous red figure is a human figure without arms. This is of a brown colour, it stands bolt upright and on tiptoe, the feet reach a little lower than the body of the serpent, the head is within the head of the red figure, the latter forming a foil. The brown figure wears a head-dress, has a girdle round the waist, and broad bands or rings on the legs at the knees; from both sides of the head, of the girdle, and of the leg bands tassel-like ornaments are suspended similar to those already described, giving the appearance of being made of knotted twine, generally with three fringes at the knots, sometimes only one or two ends or fringes. These articles are all which the figure wears. From the lower side of the solitary right arm, and from the throat of the serpent, there hang similar tassel ornaments of a dark brown colour. The greatest height of this painting is about 8 feet, the greatest width about 5 feet.

Group IV. (Plate VI., fig. 2) has for background what is evidently a huge symbolical painting of a sun-god coloured red. It appears to be placed in a horizontal position, the bullet-shaped head is formed of three concentric circles with a small disc in the middle. From near the upper part of the head, detached red rays extend outwards. The head rests on a short neck, which rests on the middle of the convex side of a crescent-shaped device meant for arms. This consists of two endless bands, one within the other, bent to form a crescent. The concave side of this crescent rests on the sharply-rounded curve of the outer of three similar bands, one within the other, the six ends forming the termination of the trunk, and completing the symbolical figure. Drawn perpendicularly across the trunk, are portions of four human figures, one complete except feet and arms, another *minus* feet and having the arms extended upwards in an attitude of prayer, the two others *minus* arms, neck and feet. Each of the first two has three of the tassel-tipped cords or ribbons hanging outwards from the crown of the head. All are furnished with belts round the waist with a tassel at each side.

It seems to me that the most important of these groups are Nos. I. and III. The characters on Plate V., fig. 1, are of the same type as the Lampong letters, and at once suggest Sumatra as

the native home of the artist. This supposition is confirmed by an inspection of the plates and explanatory letterpress at the end of the "Bataksch-Nederduitsch Woordenbock," by H. N. Van Der Tuuk. In Plate VII., fig. 1, is an ear-ring worn by women, the resemblance of which to the spiked ornament in the Australian picture is so close as to leave no room for doubt that they both are delineations of the same kind of personal ornament. And from Van Der Tuuk's plate, we learn both that the ornament on the Australian picture was not completed and how it would have looked when finished. In Plate XXII of same work, there are illustrations giving us a clear idea of what the tassel ornaments in the Australian pictures are meant for. The figures in Plate VII. may be compared with the corresponding Australian ones.

I have no explanation to offer of the human figures in Plate V., fig. 1. I would just draw attention to the fact that the arms of one, if not of two, of the figures are skeleton arms, a pretty sure indication that the picture is symbolical. The head-dress of the small figure beside the kangaroo is surmounted by what appears to be a head.

In Plate VI., fig. 1, the large red figure with its accessories is manifestly of religious significance. It might mean anything or nothing but for the three most striking features, the skull, the serpent, and the rays. From time immemorial in mythology the serpent has been a token of divinity, ancient statues or paintings of deities were seldom without it. In Indian mythological paintings Parvati (or Kali or Devi), the consort of Siva, is usually represented as wearing a necklace of skulls, or holding one or more skulls in one or other of her hands, or under both of these circumstances. One or more serpents are also usually associated with this goddess. As Parvati she has only two hands, under other aspects the hands are multiplied.

In Moor's Hindu Pantheon, Plate 27, Parvati has a serpent hanging from each ear, one round the neck, and another round the waist. In Plate 29, Maha Kali holds a head on the tips of the forefinger and thumb of each of the two upper hands, and in each of the two lower ones she suspends a head by the hair; she also has on a necklace of skulls. This is the most venerated goddess of the Hindus, as being most to be dreaded, and most requiring to be propitiated.

Plate 29, gives an Avatara (or Scene) of Siva, seated on the folds of a serpent, the head of which surmounted the god's head. This figure has four hands, in one of which she holds a head by the hair. Another mark of Siva, is a halo round the head. In Coleman's "Mythology of the Hindus," p. 91,

Parvati is represented under the form of Kali, the consort of Siva, in his destroying character of Time. In Plate 19 she is shown as a personification of Eternity trampling on the body of Siva, her consort, Time, in one hand she is holding a human head. Hindu pictures in which the god is represented seated crosslegged with his consort on his lap, and his arms around her are frequently to be seen.

These references, should, I think, be sufficient to identify Plate VI., fig. 1, as a combined representation of Siva and Kali.

A conjunct view of these paintings leaves no doubt as to the nationality of their authors, and the significance of the best of them is tolerably clear. It is obvious that there has been an attempt to present pictorial fragments of Hindu Mythology in the confused form which has been developed by naturalization in Sumatra. The attributes of both Siva and Kali his consort are allegorically expressed whatever the names may have been by which these deities were known to the artists. Daibaitah, with his three sons and their proxies may be a version of the Hindu triad which has been freshly elaborated perhaps unconsciously by the Sumatran mind. One is naturally curious to discover what the three rows of rings on the right of Daibaitah and the two marks on his left may symbolize. In these, also, there is an imitation of Hindu sacred allegorical art.

In Moor's "Hindu Pantheon," on Plate 40, there is a figure of Devi, at the side of which there are two perpendicular rows of oblong marks, some oval, some rectangular, five in each row.

On the same plate, Bhavani (or Devi) is represented with two perpendicular rows of oval marks, three in each row. On Plate 41, two different representations of Devi have, round the border, the one a string of imperfect circles, the other a string composed partly of circles partly of squares. A third picture of her on the same plate has a border of circles at the bottom, and near the head are a crescent on the right and a circle on the left, manifestly symbolizing the moon and the sun. Other plates of Devi have rows of rings at the bottom, with a crescent and a circle near the head. There is doubtless as close a relation between the circles on the Australian pictures, and those on the Indian ones, as between the names Daibaitah and Devi. They indicate attributes of the particular deity.

Dr. Adam Clarke says that the o o o among the Hindus is a mystic symbol of the deity signifying silence, which seems scarcely an adequate explanation. Perhaps the inference that the two marks standing apart near the left shoulder of Daibai-

tah may symbolize the sun and moon, is rather bold and unwarranted, but from comparison with the Hindu pictures one cannot help a surmise that this may be the case.

The artists of these extensive works must have spent an immense amount of time and mental and physical energy in their execution, the first impulse being probably imparted by religious feeling. One cannot but believe that there were a number of sacred men among the immigrants from Sumatra, and that some at least of these caves upon the decoration of which skill and labour were so lavishly spent, were shrines where worship was offered. Just under the roof-tree in Sumatran temples (?) (*Sopo*), there is a carving of a human head called buwaja-buwaja, *i.e.*, the figure of a crocodile, because in earlier times and even still in primitive places instead of a man's head the figure of a crocodile is placed in that position[1]—this is interesting as suggesting a sacred meaning attaching even to Plate V., fig. 2.

Whatever influence these religious foreigners may have exerted in the neighbourhood of the Glenelg and Prince Regent Rivers it seems to have all but faded away. Mr. William Froggatt, of Sydney, N.S. Wales, visited the Glenelg River in 1887–8. The aborigines could give no satisfactory account of the paintings, but said they were pictures of the "Nauries," black evil spirits whom they were afraid of. This ignorance as to the origin of the pictures goes to show that they must have been done at least a hundred years ago. As regards the "Nauries," Mr. Joseph Bradshaw informs me that "the only religious ceremony practised by the Yuons (in Kimberley, N.W. Australia) is an occasional corroboree in honour of Nāri, of whom they cannot or will not give much information, but ascribe to him (or it) the creation of all things long ago." The name Nauri may prove a means of obtaining further light upon the relation between the Sumatrans and the Australians of the north-west coast.

The rite of circumcision was probably introduced to Australia by Sumatran natives, a view which is confirmed by local distribution of this practice. The making of hand-prints upon rocks in red mostly, but sometimes in black, which may be considered universal in Australia, is probably a practice derived from the same source, for Capt. Grey (now Sir George Grey) saw a hand and arm done in black, and Flinders' party saw a hand painted presumably in red. In India the print of a hand is said to be emblematic of taking an oath.

It is not too much to expect that careful investigation may

[1] Bataksch-Nederduitsch Woordenbock (H. N. Van Der Tuuk) Letterpress at end of book. Explanatory of Plate II.

demonstrate the religious beliefs and sacred or mysterious rites of the Australian aborigines to have been largely inspired and shaped by the settlement of people from the island of Sumatra deeply imbued with religious feeling.

Description of Plates IV–VI.

Plate IV.

Fig. 1.—Rock painting discovered by Sir G. Grey, executed on the sloping roof of a natural cave (p. 44).
Fig. 2.— Ditto Ditto (p. 44).

Plate V.

Fig. 1.—Group of five human figures, a snake and kangaroo (p. 47), discovered by Mr. J. Bradshaw.
Fig. 2.—Two female figures and a crocodile (p. 47).

Plate VI.

Fig. 1.—A figure roughly representing the upper part of a human form (p. 47).
Fig. 2.—A huge symbolical painting of a sun-god (p. 48).

Dr. Tylor exhibited a collection of the rude stone implements of the Tasmanians, showing them to belong to the palæolithic or unground stage of the implement maker's art, below that found among prehistoric tribes of the mammoth period in Europe, and being on the whole the lowest known in the world. Fragments, or rough flakes of chert or mudstone, never edged by grinding, but only by chipping on one surface with another stone, and grasped in the hand without any handle, served the simple purposes of notching trees for climbing, cutting up game, and scraping spears and clubs. The Tasmanians appear to have kept up this rudimentary art in their remote corner of the world until the present century, and their state of civilization thus becomes a guide by which to judge of that of the prehistoric Drift and Cave men, whose life in England and France depended on similar though better implements.

The Tasmanians, though perhaps in arts the rudest of savages, were at most only a stage below other savages, and do not disclose any depths of brutality. The usual moral and social rules prevailed among them; their language was efficient and even copious; they had a well-marked religion, in which the spirits of ancestors were looked to for help in trouble; and the echo was called the "talking shadow." Such facts make it clear that neither antiquity nor savagery reaches to really primitive stages of human life, which belongs to a remoter past.

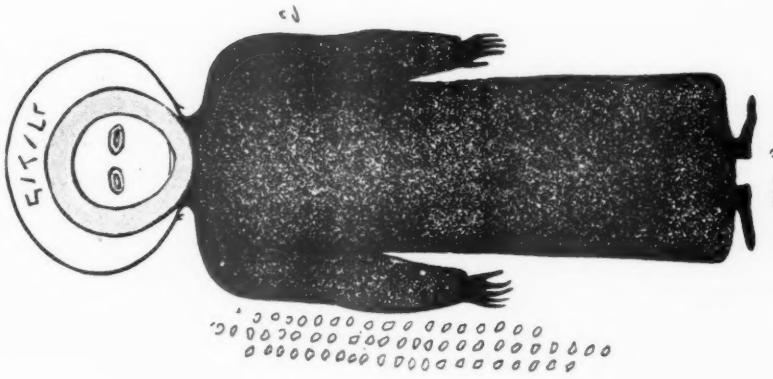


FIG. 2.

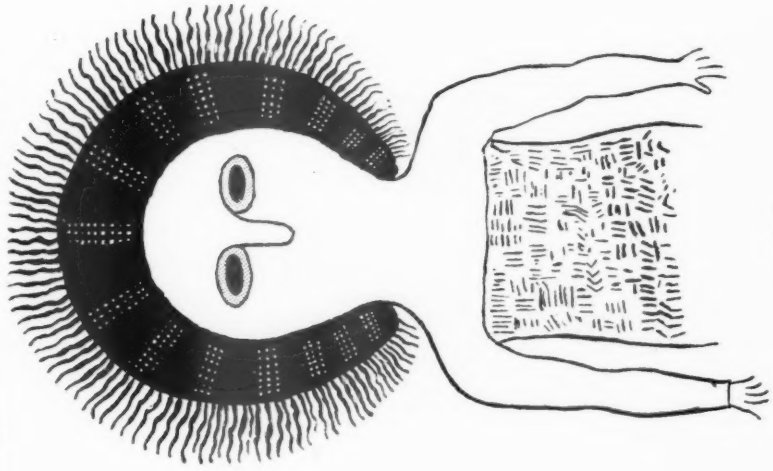


FIG. 1.

FIG. 1.

FIG. 2.

FIG. 1.

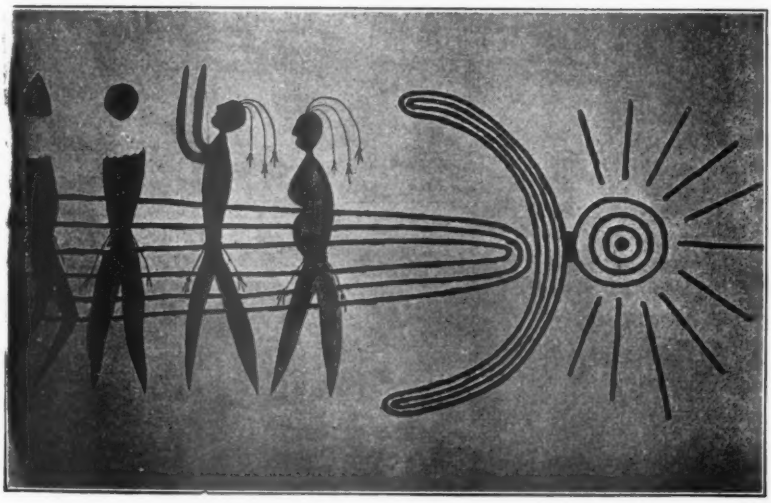


FIG. 2.

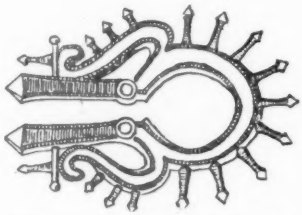


FIG. 1. DURIDURI. EAR-RING WORN BY WOMEN.

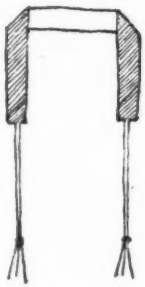


FIG. 2.
CHAPLET FOR FOREHEAD.

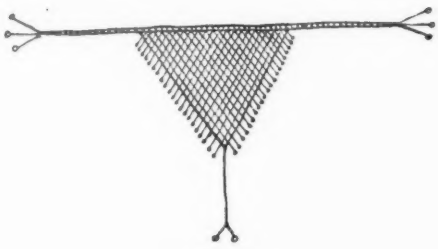


FIG. 3.
HEAD-DRESS WORN OVER THE HAIR BY WOMEN.

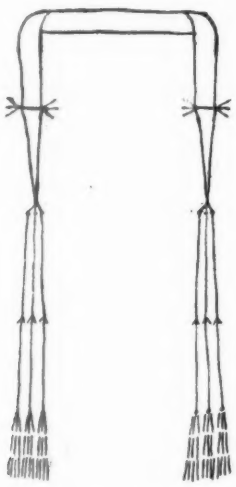


FIG. 4. WORN ON THE FOREHEAD BY A BRIDE.

ANTHROPOLOGICAL MISCELLANEA.

A few NOTES *on the* STRUCTURE *of* YAHGAN.

BY T. BRIDGES.

Alphabetic Key.

A a, *a* in *haze.*	E e, *e* in *men.*	Ɛ ɛ, *ea* in *each.*	I i, *i* in *ill.*
Ą ą, *a* in *flask.*	A ɑ, *a* in *at.*	Θ ɵ, *a* in *all.*	O o, *o* in *ox.*
Ų ų, *oo* in *food.*	Ʊ ʊ, *oo* in *foot.*	Ơ ơ, *oi* in *oil.*	Ɨ ɨ, *i* in *isle.*
Ꝍ ꝍ, *oe* in *hoe.*	U u, *u* in *us.*	Ȣ ȣ, *ou* in *our.*	Ꞩ ꞩ, *er* in *herd.*

[*N.B.*—This last vowel is written Ꞩ ꞩ, and is only used in foreign words in translations or otherwise introduced, and is sounded as *ear* in *earth*. Its printed form might be represented by Ꞩ as a capital and ꞩ as a small letter.]

ALL the consonants of English, save *x* and *q*, are in use, and have their *proper* sounds *only*; thus, c is hard like *k*, g as in 'lag;' s is always sharp. Also, the combinations of letters used in English are not used in Yahgan, but for these we have separate letters; thus, Ȼ ȼ is *ch* in 'chap,' Ʃ ʃ is *sh* in 'she,' Ŧ ŧ is *th* in 'thin' and Ð đ *th* in 'the,' K k is the *ch* of the Germans, Ł ł the *ll* of the Welsh, Ɽ ɾ is an aspirated and trilled *r*, Ɲ ɲ is an aspirated *n* (almost *kn*), Ŋ ŋ is *ng* in 'sing,' Ʒ ʒ is *s* in 'pleasure,' or the *j* of French; whilst Z z is the common *z*. Three marks, written over the vowels only, (and their sounds *always* precede them) are: ´ = *h*, ` = *y*, ¯ = *w*. These sometimes unite, as: ˚ = *hw*, and ^ = *hy*. Samples in English words: ɜŧ, worth; ɜz, years; ų̀, ewe *or* you *or* yew; Ų̂, Hugh, *or* hew *or* hue; ú, who; á, hay; ā, way *or* weigh; à, yea; és, hair *or* hare; ēs, ware *or* wear, és, where; ųz, ooze; ų̀z, yews *or* use; úz, whose; ót, hot; ōʃ, wash; ōȼ, watch; ót, what.

Consonants in Yahgan are frequently found doubled, and are always to be both sounded, the former with the vowel which precedes it, and the latter with that which follows, thus: Ucca, a lake, also

an expression of pain; at-ta, to cut, to snip, to pare or peel; issa, to grow, produce fruit or seed; ʉʃʃa, up there, far up, further up; ūr-ri, to wade; èr-ri, to splash (as a scudding shoal of fish); ul-la, a sore; ulla, to land; illi, to bathe; umma? isn't it so? ummji? didn't I say so? im-man, uncle, mother's brother; unna, everywhere; innəalan, in all the upper or inmost parts of any room, also the western parts; īnni, my elder sister; ŏa īnnùalan, my elder sisters; uppuʃ, a sea egg; tuppi, to pay a formal visit; um-muʃ, the common barberry.

Sometimes three consonants are found together as tstēɑ, paint, paint-brush; tstukgɑmata, to give by mistake, either the wrong thing or to the wrong person; tstuʃata, to blow hard in squalls; ɕgįsinanalaguna, to offer to help; ɕgumaca, materials for plaiting.

On the other hand, words often consist of vowels only, and three or even four vowels are found together, as: ŏi, stone; ɔiįa! it is a stone! ɔià, a young one; ɔiįamalim, the little ones, the brood; à, mouth; ècįa, a little mouth; įįa, it is the mouth, or, it is its mouth; ùįa, jealous; und'ucįįa? has he gone up? ucįįù, he has not gone up; und'ucįəa, will he go up; und'ucįįeləa? will he go up again; Ɬuɛna cunjima cįa, call him quickly; Ɬieləasa cunjima, call him again; uəaçia! why, it's a man! ɑqgunnɑ! I wish it was a man, or a male!

The Accent.

Generally dissyllables are accented on the first syllable, as: Mɑca, long; pàtuk, wide; ūrur, a tree or log; ata, take; įì, call; gɑmu, to bring or carry; mɑni, stop stay, ūna, to wind; ūla, to unwind; mɑna, to carry (as sticks on the shoulder); gįa to spear; ucu, to hurl or shoot; ēna, a fly; ɛna, winter; cɛsi, summer, &c. Some are accented on the last syllable, thus: Up-pɑʃ, the sea egg, the burr of a plant; whilst ɑpuʃ is wise; uzɑʃ, a tree fungus. There are so many exceptions with respect to words of three or four syllables, that no rules can well be given, yet more frequently than not the accent is on the antepenult, as: Acɑpɑʃata, to split through; Dɑgɑpataguna, to level out, spread out, to hold open or out; ɑnan cugɑrata, there is a canoe on the water; ɑnan cucīsategeata, the canoe is pulled up on the beach; cɑpɑnaca, snow; belaca, rain; ēɑʃu, to bark at, bring to bay, keep at bay (as a dog). As in Yahgan we use the acute accent

to represent the vowel-mark *h*, we are driven to substitute something in its place, and hence we subscribe for it thus : *a*ci, to strike ; ɻif, a narrow path ; àʃula, dog.

Related Letters

Are such pairs of letters as interchange. These are r and f; t, d, and r; p and f; c and k; g and k; as for example : Ura, to cry ; cuʃ-muta, she is crying; acupaɻu, to split; acupuʃata, to split up or through ; taguɻ, to give, becomes annu átak, I have given ; tuklubata, to give several ; unda tukgɻata ? is he going ? annu cutukgɻata, he is giving ; ècu, to scrape; cunna ìkgɻata ? who is scraping ? ata, to take, take hold of, to take by hand, to bring or carry, becomes annu gur, he has taken ; éturçelamus, after I have taken ; éturçelafin, after I had taken ; urdu ɻ, I have not taken ; apu, to pull up by the roots, becomes annu caf, he has pulled up ; ufèlɜena, pull up another ; ufgamata, to pull up the wrong one.

Again, in the inflection of nouns and adjectives these same rules are observed, thus : ʻIf, narrow ; èpaci, the narrow one ; suk, painful; sucaci, one in pain ; ūrur, a log ; ūruta ɻa sa ūʃtagua, you make me one from the tree ; uf, the fire-place, apun, at or in the fire-place ; apupɻ, to, or into, the fire or fire-place ; apundɜlum, from the fire or fire-place ; ucur, house ; ucan, in the house, at home ; ucatupɻ, to the house ; cunjin à ɜ ucat-ua, he is my kinsman or house man ; cundɻan mucurcɛpɻamalim, they are kinswomen to each other ; ɻan mucurà-malim, we are kinsmen to each other.

The Article

Properly is wanting, but its place is supplied in the following way :— Ua, man, cɛpa, woman ; uacin, the man, cɛpacin, the woman. Ua cucata, a man is coming ; uacin cucata, the man is coming. Lumbi, black, luʃ, red ; lumbia ɻa sa-tagua, give me *a* black one ; lumbiaci ɻa sa-tagua, give me *the* black one. Similarly, luʃa and luʃaci. Similarly, uapɻ, two men ; uapicin or uacipɻ, the two men. Similarly, uacindɻan cucata, the men are coming ; and uandɻan cucata, men are coming (plural). Similarly, cɛpapɻ, and cɛpacipɻ or cɛpapicin (dual). Thus, in the plural, cɛpandɻan, indefinite, and cɛpacindɻan, definite : uɻamalim, the men (plural) ; cɛpɻamalim, the women ; cɻùalɻamalim, the children.

Nouns

Are of all kinds, monosyllabic, dissyllabic, and polysyllabic; they end either with vowel or consonant; they are original, or derived from verbs and adjectives. A few samples :—

Ų'f, a fishbait; uf, the hearth; uʃ, bone necklace, also semen; ùʃ, the hand, or finger; áscul, the fist; uʃcugin, thumb, also the larger claw of crabs; uppuʃ, currant-bush; uppuʃ, sea-eggs; apuʃ, spittle; guʃ, the smaller end or point; ʃun, the larger end or butt end, the root end of a tree: uʃta, hair, such as grows on man's head, on the horse's tail and neck; açela, short hair, such as grows on the human body generally, also on the skins of animals; ą̀ʃun, beard, whiskers, moustache; tell' açelá, eye-lashes; ʃip' açela, eye-brows; álaʃun, the hair of mussels, by which they attach themselves to stones, also other hair of the human body not enumerated above; ɟòan, wing-feathers; uftucu, feathers; dubim, down of birds; ɜi, a stone; ɟùf, a stone; lɜi, a block of stone; ląʃa, rocks, specially such as are flat and have hollows under them; ląguri, rocks, bold rocks, large masses of rock; áracur, precipice, cliff; ɟif, a ridge, from ìf, narrow; patacun, an old spread canoe, from patuk, broad, wide; áʃuk, gravel, shingle; áʃągun, a shingle beach; ląpik, sea mud; suscuna, land mud; uʃʃealan, the upper creeks of a bay or river, from uʃʃa, high or far up a bay; tąta, a handle, from ata, to take by hand; tēaca, an axe, from ēaca, to hew down a tree; tēa, a bed, from ēa, to lie down; ɕgąmų, plate or dish, from gąmų, to carry as meat on a dish; ɕgɟa, anything used for striking with the point, as a spear, dart, harpoon, &c.; tųmɛna, the place of descent, from mɛna, to descend; tucɟa, the place of ascent, from ucɟa; ɕgɟama, a spade or any digger, from gɟama, to dig; atama, food, from atama, to eat; tatama, things used in eating, also place or time of eating; tątųèlla, remnants of a meal, from tątųèlla, to leave off eating. Similarly, tɟèlla, remnants of drink, from tɟèla, to leave off drinking, from ula, to drink; tstumɛèlla, things left after part have been removed, from tųmɛna, to take away, and tstumɛèlla, to leave off taking, and leave part unremoved; tągupųèla, what is left unkilled, from acupuna, to kill, and tągupųèlla, to leave off killing. And so I might go on for many pages.

Adjectives,

Like substantives, are of all descriptions, but are not very numerous.

They generally precede the noun, and many serve also as adverbs. They are all made into nouns after this manner:—Muca, long, tall, high; mucaci, the long one. Matu, sharp of edge; matuapi, the two sharp ones. Mura, sharp of point; muracindjan, the pointed ones. Àrumba, naked; arumbacindjananima átudupea, I will clothe those who are naked; àrumbanaſindjan, those who were naked. Adjectives are readily made into verbs; thus:—'Asi, steep; ēasina, to make steep. Abila, strong; muabilana, to exert oneself to do anything with vigour; muabilan'-atega, to row with force; maabilanaci, to strike with force. Luſ, red; luſana, to be red; luſunata, to get red; luſunurcataca, to grow redder; tuluſana, to paint or make red; uluſumuni, to let a thing remain red, not to alter its colour, or destroy or remove it; luſumutu, to be red. Said of a person seated, or of any object somewhat prominent; as, cuna sùan luſumutu? who is that seated there? Said of one who is of a reddish tinge; luſumuni, to be red. Said of a standing person or of any very prominent object; luſanea, to be red, said of any prostrate person or thing; also, culuſaneatacun, a red line or band; cu'uſuŋgarataeun, a red line, streak, or band, on the water.

Degrees of comparison are as follows:—Luſ, red; ājſa luſ, redder; luſ cɔs, somewhat red, or redder; ím luſ, very red; ím luſ ājpan, very or exceedingly red; maneana luſ, reddest, or very red.

Use of adjectives:—Tellą-luſ, having a red face, or red face; tellą luſa, one who has a red face; tellą luſaci, the red-faced one; luſ ua, a red man; luſ uapi, two red men; luſ uiamalim, the red men (*pl.*); ua luſa, the red man; ua luſacipi, the two red men; ua luſacindjan, the red men. 'Eca, little; maecapi, two little fellows or things which are together; maeciamalim, little fellows, said of a group of such, with none among them who are not such; èciamalim, the little ones (= ècacindjan); ècapi, two little ones: ècacipi, the two little ones; ècunata, to grow or get small, to shrivel, diminish, or lessen; écunurcataca, to grow less and less; ēacunata, to make small, diminish; ēacunurcataca, to make less and less; maacana, to make oneself small, or say one is small; tēacana, to break up, destroy.

Pronouns

Are numerous, have three numbers, have all the forms of, and are declined like nouns, or rather nouns like them. They are as follows:—

'Ɛ, I; ía, me, to me, for me; íacia, to me, for me, me; íaciipi, with respect to me, for me. Dual, ípi; ípicia, obj. case. Pl., ían;

obj. case, ʃananima, or ʃananicia. Poss. of above :—Sing.: ɔ́a, my; ɔ́acin, mine; ípicina and ípicinacin, our, ours. Pl.: ʃananina or ʃananinacin, our, ours.

2nd pers.: sing. sa; dual, sapi; pl. san; obj. case, scia; dual sapicia; pl. sananima, or sananiciipi: poss. sine, sinacin; dual, sapicina, sapicinacin; pl. sananina, sananinacin.

3rd. pers.: sing., masc., fem., and neuter, cunjin; dual, cunda; pl., cudjan; obj. cases, sing., cunjima, cunjimicia, and cunjimiciipi; dual, cundacia and cundaciipi; pl., cundjananima, cundjananicia, and cundjananiciipi; poss., cunjimina, cunjiminacin; dual, cundacina, cundacinacin; pl., cundjananina, cundjananinacin.

Note.—Āpan added to these obj. and poss. cases makes them very emphatic and restrictive, and may be translated 'only,' or 'very,' according to the sense, as: ɔ́a āpan, my very own.

Other personal pronouns:—Ançin, he or she there = that one there; from ançin (adv.), there, in that place; obj., ançinçicia; poss., ançinçi, or ançin çɛacin, or ançinçia. Sùan, he, she, it; from sùan, there: this word is used for objects or persons less distant than ançin: obj., sùançi, sùançicia, sùançiciipi; poss., sùançi, sùançia, sùançiacin; dual, ançindai sùanda; obj., -daicia; pl., ançindjan, sùandjan; obj., prefix the primes ançin sùan to these two parts, -djananima or -djananicia.

The Yahgans, in the use of pronouns, always indicate the position of the person spoken of, and have such special class of pronouns in all forms complete as the foregoing. These pronouns are derived from adverbs of place, and from prepositions, and other pronouns. Thus: Ʊʃʃa, he, she, or it; referring to an object at the upper end of a wigwam, opposite the door, or a person up at the head of a creek or valley. Iŋga, he, she, or it; a person or object on either side of the wigwam, and within it. Ʊra, he, she, or it; in the wigwam, at the door end. Ɛla, he, she, or it; outside of the house.

Also, these are of three classes, having reference either to position with respect to the person speaking, when they begin with ɔ́a, 1st poss. personal pronoun; or to the person addressed, when they begin with s or si, from sa, 'you;' or to the person spoken of, when they begin with cunji, or ciçi, from the 3rd personal pronoun cunjin (or ciçin, 'his' or 'hers').

The other part of these pronouns are made up of the prepositions Cągu or cąpu, on the upper or higher side of; cillu, on the lower side or end of; mątu, on the north side of; cutątu, on the south side of;

cu, on the west side of; muçi, on the east side of. All these pronouns are perfect, having the three numbers, obj. and poss. cases, just like other pronouns.

I will here give a few examples. In translating into English we should simply render these place-descriptive pronouns by 'he, she, they ; him, her,' &c. 'ƃamuçi, he, &c., eastward of me; simuçi, he, &c., east of you; cunji muçi, he east of that place or person, and near it or him, but always *beyond*; 'ƃacqgu, he above or higher up than me; scqgu, he above or higher up than you ; ciçicqgu or cunjicqgu, he above or higher up than him, like ciçimuçi.

The inflexions are regular; thus, ƈamuçi, he ; ƈamuçi'nçiçia, him, her; ƃamuçinçia or -çiqcin, his, hers ; ƈamuçindai (dual), they ; ƈamuçindaiçia, them ; ƈamuçindacina -qcin, their. Pl. . ƈamuçindian, -diananiçia, -ima, them ; -diananinqcin, theirs. Similarly, ƈacqgu, ƈacqgunçi -çiçia, obj. ƈqgunçi, -çia, -çiqcin, his; scqgu, scqgunçi -çiçia, çia, çiqcin, &c. The above are also demonstratives, having reference to the position indicated by the preposition, and mean 'that, there.'

Demonstratives.

'ƃan, this, here; sùan, that, there; ançin, that, there; cunjin, that, there ; uʃʃa, that, there: see what is said of this word above, and of these following: iŋga, that, there; ura, that, there ; ɛla, that, there; inna, that, there (has reference to higher position on the beach or the land) ; ɛta, that, there (refers to place lower on the land or shore). These are also inflected like other pronouns for number and case. Thus, 'ƃan, this ; dual, ƈandai ; pl., ƈandian ; obj. ƈançi, -çiçia ; dual, ƈandaiçia ; pl. ƈandiananima, ƈandiananiçia. The poss. is regular : ƈançi, sùançi, ƃançia, -çiqcin, -daicina, &c. &c.

Reflectives

Are as follow:—Maam, 'self,' with reflective form of verb; thus, uʃqgu, to cut; maʃqgu. to cut oneself; ámaʃqguda maam, I cut myself; ámaʃqguda ùʃ, I cut my finger; cufqguda ʃa ùʃ, he cut my finger; cumaʃqguda ùʃ, he cut his own finger; cuʃqguda ciçiçia ùʃ, he cut his (not his own) finger; cumaʃqgudu maam, he cut himself.

Tupan, used with the pronouns, somewhat altered, makes them reflective; and this form in the pl. makes it more emphatic; and qpan added still more emphasizes it; and ʃm prefixed to this still more again. Thus: étupan, I myself, or by myself, or I only; obj.,

ʃatupan; poss., ɔatupan, mine. More emphatic form of above: étupɔala (no obj. or poss.); étupɔala-āpan, I by myself alone, or I of my very own mind, without the least incitement from anyone; and ɟm étupɔala āpan (no poss. or obj. case), means my very own self; ɔa āpan, my very own. Similarly with the other two persons; thus, sa-tupan, ɛcɟa-tupan, sinq-tupan, and the other more emphatic forms; also, cunji-tupan, cunjima-tupan, ccnjimina-tupan, cunjiminq-āpan, and ɟm cunjiminq āpan, his or her very own, and no one elses.

Also: Ciçiçɟa, him, her (obj.): (this form has no subjective; it is reflective; ciçina, his own; ciçinqcin, his own; ciçinqtupan, ciçinqāpan, his or her very own. Similarly, in the dual subj., cɛpɟ, they themselves; obj. case, cɛpiçɟa; poss., cɛpicina -qcin, q-āpan, their very own; pl., cu̯on, they themselves, by or of themselves; obj., cu̯onima--içɟa; poss. cu̯onina; cu̯ocinqcin, their very own; cu̯oninq̄pan, their very very own.

Reciprocal Pronouns.

There are no reciprocal pronouns, but their place is supplied by special inflection of the verb. Thus: mucusi, to wash oneself; tumucusi, to use in washing oneself; étumucasiʃin, that with which I washed myself; étatumaʃin, that which I ate; satumucusiʃin, that with which you washed yourself; tstucusiʃin ɟa, that with which he washed me. Also, etucusiʃin, he whom I washed; satucusiʃin, he whom you washed; tucusiʃin, he whom he washed; mucusiʃin, he who washed himself; cī étumucusu̯a? with what shall I wash myself? ci étucusu̯a cunjima? with what shall I wash him? cutucusigɟatacun, he who is washing; cumucusigɟatacun, he who is washing himself; cɟtacun, he who is walking; cutuʃɟtacun, they who are walking; ɟdugaʃin, he who was walking; qnan cugqratacun sɛɟa átstqguan, the canoe which is afloat I will give you.

Further Remarks on the Pronouns.

Besides the forms and inflections given above, there is the following singular class. Pronouns may be subjectively singular, dual, or plural, while objectively they are of a different number. The verb in this case indicates the objective by the number of the pronoun. Thus: átqguda sapiçɟa nɟf, I gave you each a knife; átqgupicinda sapiçɟa nɟf, I gave you each two knives; áq̄tuda sapiçɟa

nįf, I gave knives more than two to each of you. 'Ɔqpį ɔ́an, these two are mine; ɔ́ątupan ɔ́an, these (pl.) are mine; sapicinqpį ɔ́an, These two are yours (sing); sinątupan ɔ́an, these (pl.) are yours (sing.); ciciŋgįatacun sina, that which is in *the basket* is yours; amągua cutįikgįatacun ɔ́a, the sweet things in *the basket* are mine.

Interrogative Pronouns

Are: Cunna? who; dual, cunnai? or cunnaų? (cunnįan? pl.); obj., cunima? or cunicįa? poss., canɛna? or canɛnącin? or cįnna? or cįnnącin? dual obj., cunnaicįa? poss., cunnacina? pl. obj., cunnįananima? cunnįananicįipį? or cunnįananicįa? pl. poss., cunnįananina? or cunnįananinącin?

Cunji? which, or what? dual, cunjiąpį? pl., cunjidįan. *Note.*—Closely connected with the above cunji is a small class of words, where between question and answer the same difference is observed in each couplet. Here they are: Cunji? which? cunji, that, such an one; cųtupį? whither? cutupį, thither; cullum? whence? cullum, thence; cundąm? how? cundąm, so. Here are a few allied words: Cī? where? in what place? also, to what place? cumųdųa? what is it? what do you want? what's up? what can it be? cumųdųupį? for what? for what reason? cɛtamagųta, for no particular reason; ųląf, for nothing, with no object, freely; ųląf cųląf, for no special reason; ųląf cųląf ųląpun, same as ųląf, only stronger; apa? what? how? what of? what about? apa cunjin? how is he? what of him? apa sa? how are you? what of yourself? apuma cunjin? come now! tell me, how is he? ap'įi! I don't know! I don't think I will, or I don't think you will, or I don't think he will, or I don't know! I don't think I can, you can, he can, or I did, you did, he did; apala! ah! what of it, I wonder! I don't think I, you, or he will, or did; apacun! well! and what of that? or well! and what have you to say? or well! and what did you do? apa? may? thus, apa ûį ɛątacų? may I go?

VERBS,

In Yahgan, as in all American languages, are relatively more important than they are in European languages. In Yahgan the verbs naturally class themselves into four sets: 1st, those which end in ų; 2nd, those in a; 3rd, those in i or ů; and lastly, those in įi. The two first comprise nineteen-twentieths of all the verbs.

Among the ten thousands of verbs only two are in their roots monosyllabic,* though some few are only of two vowels, as, for instance, ùa, to bite; ia, to sew a bark bucket or cup, or (2nd) to fasten the many-notched spear in its shaft by binding it in; āa, to repair a canoe by re-sewing the seams. Very many are of three letters and dissyllabic, others trisyllabic, others polysyllabic. They are very fully inflected, and are *very* susceptible of composition with each other. Many of the verbs are so changed as to be scarcely recognised in these compositions, as perhaps has been already observed; for instance, tièla, to leave off drinking. In this word the i is the verb, derived from ula, to drink. Ufèla, to draw out more, as carrots from the ground. Here the uf is the verb, coming from qpu, to pull up by the roots. Ata, to take, becomes gur, he takes; ura, to cry, becomes cuʃ, he cries; qcu, to rake out (say mussels) from the fire; cqk, he rakes out; ula, to drink; cul, he drinks; ɖtul, I drink; sul, you drink; uɛielɐa sa cunjima, let him lie down a little longer. Here ɛ is the only sound which represents the principal verb ēa, to lie down. Yet to a person knowing the euphony and interchange of sounds of Yahgan the verbs are very traceable. Thus uʃ would be recognized at once to spring from úra, to cry; ur from ata; uf from qpu; uk from qcu; uɛɜɛna from uɛa; and so on.

In the first class of verbs, in u, the future is formed in ua; thus, tqgu, to give, átqgua, I will give; ūlu, to eat eggs; áūlua, I will eat.

The 2nd class, in a, form their futures in ɐa; thus: ēa to lie down; átɛɐa, I will lie down; ura, to cry; áturɐa, I will cry.

The 3rd class, in i, form their futures in ùa; thus: cuçi, to go; ácuçùa, I will go; muçi, to put on one's head a band, cap, or any headdress; (2. To enter, go, or come into a room); ámuçùa, I will go or come in, &c.; usù, to pluck; átusùa, I will pluck.

The 4th, in ii, make their futures in iùa; as, átēiùa, I will feed; from tēii, to feed; álupiùa, I shall fall, from lupii.

Inflections of tqgu, '*to give.*'

I. Present.

1st pers. sing.,	átak	dual, ípa tak	pl., ian tak.
2nd „	„ satak	„ sapa tak	„ san tak
3rd „	„ cutak	„ cutqgupi	„ cutqgusin

* These monosyllabic verbs are: cq, to go for fuel; çcq, to be at work making a canoe; áoɐa, I will go for fuel; cuçcamuta, he is at work making a canoe.

Obs. 1. The first one or two syllables will be seen at once to be the pronouns shortened, or slightly changed. In the third pers., the pronominal prefix cu is from the 3rd pers. pronoun cunjin. The verb indicates the number, pį being dual from cumbįbi, two, and the 'sin' is the sign of the plural, derivation unknown.

Obs. 2. In interrogative forms, the 1st pronominal prefix is é I; the rest are the same as above, only in the 3rd pers. in each number the cu (pronominal prefix) is never used.* These two rules hold good in all subjective tenses; as étągasa, should I give; tągasa, should he give, not cutągasa.

Obs. 3. Annų preceding the above tense, all the inflections being unaltered, is the perfect tense; thus, Annų átak, I have (just) given.

Obs. 4. Annų preceding the form underneath, means the same as above, without reference to time; thus, Annų átąguda, I have given, also, I did give.

II. Past tense.

1st pers. sing., átąguda	dual, ípa-tąguda	pl., ʃan tąguda, I, you, or he gave
2nd „ „ sa-tąguda	„ sapa-tąguda	„ san tąguda
3rd „ „ cutąguda	„ cutągupicinda	„ cutągusinda

III. 1st Future (*will* or *shall give*).

1st pers. sing., átągua	dual, ípa-tągua	pl., ʃan tągua
2nd „ „ sa-tągua	„ sapa tągua	„ san tągua
3rd „ „ cutągua	„ cutągupicinoa	„ cutągusinoa

Obs.—The above means the 'future,' close at hand. If time further distant is intended, then na is affixed to the above form right through.

IV. 2nd Future (*am about to give*).

1st pers. sing., átąguanda	dual, ípa-tąguanda	pl., ʃan tąguanda
2nd „ „ sa-tąguanda	„ sapa-tąguanda	„ san tąguanda
3rd „ „ cutąguanda	„ cutągupicinoanda	„ cutągusinoanda

Obs. 1. Annų, preceding the above forms, makes them very emphatic.

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* In verbs beginning with vowels the pronominal prefixes are shortened thus: átatoa, satoa, catoa, I, thou, he will take; ípsapatoa, catapicinoa, we, you, they will take; ʃansanatoa, catusinoa plural, we, &c., &c.

Obs. 2. Unda, preceding the above forms, makes them interrogative. The only irregularity is in the first pers. sing., and the 3rd pers., of the 3 nos. 1st sing., ɟnd' étqgua, shall I give; and, as before remarked, in the 3rd pers. the pronominal prefix is lost, thus: unda tqgua, will he give? unda tqgupicinoa; unda tqgusinoa. *Obs.* 1, above, refers equally to the emphatic and interrogative forms.

Obs. 3. The past tense in 'da' with unda preceding, after the same manner as in the future tenses, and in the past interrogative form next below, means much the same as the form below.

V. Past interrogative (*did?*).

1st sing., ɟnd' étqgara? und' ípa tqgara? pl. und' ɟan tqgara
2nd „ unda sa tqgara? undasapa tqgara? „ unda san tqgara
3rd „ unda tqgara? dual, unda tqguraqɟ? „ unda tqgusinara?

Obs. 1. 'Ca' affixed to this form, and other like past tenses, and 'aca' to forms ending in da, in past tenses, whether interrogative or positive, make these tenses more past; in fact, without this affix, they are rather present past.

Obs. 2. From this last form in 'ura' a participle is formed, thus Ɬa sa tqguracun, that which you gave me.

VI. Imperative Forms

are numerous, but the following are the principal:—

Tqgɜena, give, sing.; tqgɜenqɟ, give ye (two); tqgɜenisina, give (pl.); tqgua sa, sing.; sapatqgua, dual; tqgusina, pl., less strong than the above; sa tqguan, sing.; sapatqguan, or tqgusapɟnna; dual, tqguasanna. This last form is strong, and decidedly future; as, you *shall* give.

Obs. 1. The form for the third person 'let him,' &c., is but a regular inflection of regular verbs, which are all formed by simply prefixing the letter 'u.' Ʉtqgu, to let give; átutqgua, I will let give; cutqguda, he let give; utqgɜena, let him give; utqgupuuna, let them (two) give, or let him give two.

VII. Subjunctive Forms

are much used. The following are a few examples:—

Present (*when* or *if I give*).

1st. sing., étqgumus dual, ípa-tqgumus pl. ɟan tqgumus
2nd „ sa-tqgumus „ sapa-tqgumus „ san tqgumus
3rd „ tqgumus „ tqgupicinqmus „ tqgusinqmus

Present, No. 2 (*should* or *if I should give*).

1st sing., étula tqgasa dual, ſpa-tula tqgasa pl., ſan tula tqgasa
2nd „ satula tqgasa „ sapa „ „ san „
3rd „ tula tqgasa „ tula tqgupicinasa „ tula tqgusinasa

Obs. 1. The addition of 'ca' to the verb, as 'tqgasaca' makes the present past; thus, 'Etula tqgasinda, if I had or should have given.

Obs. 2. Another form, regular, as the above, and with much the same meaning, is, étula tqgasinda, present past, if I had given; étula tqgasindaaca, past, if I had given. Future form of above, 'Etula tqguan, satula tqguan, tula tqguan, if I, you, or he should or shall give; future form, stronger, étula, sa-tula, tula tqguana, if I, you, or he should or shall give.

Obs.—In all these and other forms, where 'é' is the pronominal prefix for I, there is no pronominal prefix in the third person.

Past Tense, Subjunctive.

'Etqgaſin (aca), ſpa tqgaſin (aca), ſan tqgaſin (aca), when or which I, &c., gave; sa-tqgaſin (aca), sapa tqgaſin (aca), san tqgaſin (aca), when or which you gave; tqgaſin (aca), tqgupiciſin (aca), tqgusinaſin (aca), when or which he, &c., gave.

Obs.—The form in 'aca,' is more past than in 'ſin,' and the former has also reference to a stated time, and the word 'then' may be used; as, 'Etqgaſinaca, then when I gave, or the time when I gave; or the thing which I gave; 'Etqgaſin, or étqgaſinaca, also refer to the person to whom the thing is given. In this last sense, and also when referring to the thing given, the time of giving, or the place, is prefixed to the verbs in t, as, é-tstqgaſin, the person to whom I gave, the thing which I gave, the place where I gave, the time when I gave.

Other Forms.

Apa satula tqgu? what do you say to giving? apa ûį tqgu? may I give? or what if I should give? what do you say to my giving? Similarly in the third person, apa cunjin tula tqgu? dual apa tula tqgupicin? átula tqgua, I will give (conditional), I will not wait, or hesitate longer, &c.; étqgua cun ɔ́an! sa-tqguacun ɔ́an! cutqguacun ɔ́an, this is what I, you, or he gave! áā tak, I *will* give, I have made up my mind to give; ap' étula tqgu or tqgasa? or! what if I should, or shall give?! cutukgįatacun! see, he is giving! átukgįatacun! see, I am giving!

Negative Forms.

These require the pronoun in full after them, and have no pronominal prefixes; thus, Tukù ɟ, I have not given; tukùɑci ɟ, I did not give; tɑgunnac' ɟ, I don't give; éla tɑgaūk, I will not give (now); éla tɑgaūna, I will not give (by-and-by); étɑgunnacɑnaʃin, when I did not give; étstɑgunnacɑnaʃin, he to whom I did not give; étukìnɑmus, when I do not give; étula tukìnasa, if I should not give; ula tɑgica, or ula tɑgicunna, don't give (now) (by-and-by); cula tɑguda, don't give.

Interrogative Forms.

Unda tɑgara? has he given? or, did he give? unda tɑgupicinara? dual; unda tɑgusinara, pl. of same. These forms are made more past by adding 'ca.' When shall I give? cunji-dɑra étɑguana? when did he give? cunji-dɑra tɑguda? when will he give? cunji-dɑra tɑguana?—Tucɑçimunda scɟa étɑguana nɟf? shall I give you the knife this evening? tucɑçimunda scɟa étɑguda nɟf? did I give you the knife yesterday?

N.B.—Here, and in other instances, the tense of the verb alters the application of the noun either to time past, present or future. Thus also: ácu mealun átɑgua, I will give another day; ácu mealun átɑguda, I gave the other day; acu ámaʃunna ácilloa, I will leave the day after to-morrow; acu ámaʃunna ácilluda, I left the other day; ámaʃunna ágɟamoa, I will dig to-morrow; amaʃunna ágɟamuda, I dug this morning; cunna tɑgara? who gave? cunnaitɑgara, or tɑguda? (dual) who gave? cunnɟan tɑgara, or tɑgusinara? who gave? cunna tɑgupicinara scɟa nɟf? who (sing.) gave you two knives? cunna tuʃɑpɛnuda ɜan? or, better, cunna çiʃɑpɛnuda ɜan? who used this sling? bɑvunda la tɑgua cunjin? will he not give, think you? tukìnda cunjin? has he not given? unda tukgɟata? is he giving? tukìneali, lest he should give, (*i.e.*) in order that he may not give; étukìneali, lest I should give; sa tukìneali, lest you should give; ātula tukìnda? has he not given yet?

Muʃ, derived from mura, 'to hear,' is beautifully ingrafted into verbs, as follows:—Unda tɑguɑmuʃ? does he say he will give? cutɑguɑmuʃ, he says he will give, *or* I hear or heard that he will

give ; cutaguмuſunda, he says or said that he gave, *or* I heard that he gave ; sataguмuſunda, 2nd pers. sing. of above ; átaguмuſunda, 1st pers. sing. of above ; cutagupicinqmuſunda, they two, &c.; cutagusinqmuſunda, 3rd. pers. pl. of above.

Participles.

Besides the foregoing participles there are these following:—

'Etukgiatacun, that which I give or am giving ; satukgiatacun, 2nd pers. as above ; cutukgiatacun, 3rd pers. as above; &c. &c. Cutuмukмutacun, she who is sewing, or sitting and sewing; Cucilinitacapi, they two who are walking with boots on their feet; cumuçimutacun cap, he who is sitting down with a cap on his head; ſdugaſin, he who was walking; cutaŋgiadugaſin, he who was speaking ; çɛɛsièlaſin, the summer last past; atuèlun, after any meal ; atuìnun, before any meal (lit. not having eaten), and after having eaten ; thus, étatuèlqmus, after I have eaten ; étatuìnqmus, before I have eaten ; cupuriŋgiatacun, the lines, bars, bands, parallel lines of any kind, lit. the lines, rows, bars, &c., which are extending ; cumucanɛatacun, the line, row, band, &c., lit. that which extends in a continuous length; thus, culuſunɛatacun, the red line, row, bar, &c. ; ciàguniatacun, the white line, row, bar, &c. ; cucuſçiniatacun, the dark line, row, bar, &c.; culumbɛniatacun, the black line, row, bar, &c.

Singular, Dual, and Plural Verbs

are a speciality in Yahgan, and simplify its syntax.

The dual verbs are an inflection of the singular, but the plural are to a very large extent totally different from their singular forms. In transitive verbs the singular verbs are only singular objectively, the dual verbs are only dual objectively, and the plural verbs are only plural objectively. They have in all cases the singular, dual, and plural numbers subjectively. But with intransitive verbs those which are singular, dual, or plural are of course so only objectively ; thus, ácuçùa, *I* will embark ; whilst, like all intransitive verbs, it has a dual and also a plural ; yet more generally the strictly plural verb tumupi, 'to embark,' is used as its plural; thus, ſan tumupùa tucaçim, we will embark to-night.

Singular, Dual, and Plural Verbs, 1st Transitive.

Singular.	Dual.	Plural.	
tągu	tągupį	àtu	to give one, two, three, or more things
ata	atąpį	tumena	to take
dągucįa	dągucįąpį	tumenucįa	to take up
tumena	tumenąpį	tumemena	to take down
tucuçi	tucuçįpį	tumecuçi	to take on board
icemu	icemupį	tįìgu	to put in, to fill
gumulata	gumulatąpį	gumąlu	to take out, as from a bag
usata	usatąpį	usù	to pluck out, pick
gulata	gulatąpį	gulu	to pull or draw out
uteca	utecąpį	ūsella	to put down out of the hand
atupi	atupipį	āgupi	to put on board
tuūrągu	tuūrągupį	tumeūrągu	to take ashore
ucuna	ucunąpį	ųąlu	to let an object or objects stay in the water
ummunata	ummunatąpį	muna	to take on one's shoulder
mągu	mągupį	luʃʃa	to bear, produce, give birth
ēigata	ēigatąpį	ēaca	to hew, cut down a tree or trees.

Intransitives.

apuna	apunąpį	mąmįa	to die
ēa	ēąpį	upįaʃąna	to lie down (to sleep)
mutu	mutupį	magątu	to sit, to be, be alive
muni	munipį	palana	to stand, be, wait, continue
cuna	cunąpį	ąlu	to be aboard, be on the water, be.
cątaca	cątacąpį	utuʃu	to go afoot
cuçi	cuçipį	tumupi	to go by vessel, ashore, or afloat
icemea	icemeąpį	tįìgēa	to be in, as berries in a basket
utecēa	utecēąpį	ūsellea	to be, as a thing or things left; to be put down

These principal verbs are very largely used in composition; and according to the number of the verb 'objectively,' so would the pronouns 'it,' 'them (two),' 'them,' be understood. Thus: áticemuda, I put *it* in; áticemupicinda, I put them (two) in; ‹tįìguda, I put *them* in; icemɜena, put *it* in; icemɜenąpį, put

them in (dual); tɨlgɜɛna, put *them* (pl.) in; cumuɳdua tumuɳtu cunjin? what is *that* she has in her hand? cumuɳdua tumuɳtuɲi cunjin? what are *those* (two) things she has in her hand? cutumɛmuɳta, she has *them* in her hand; áɛ̄igatoa, I will cut *it* down; cunna ɛ̄igatapicinara ɔ́an? who cut down these (two) trees? ɲ áɛ̄igatapicinda, I cut *them* (two) down; ɲ áɛ̄acuda, I cut *them* (pl.) down.

Composition of Words.

To understand this subject one must know what sounds have mutual affinities; and the remarkable regularity with which such interchange is striking. They are as follows:—k into c or g, r into t, ʃ into r, f into p. The first are finals. Again, when a ends a word, and y (*i.e.* ʻ) begins the next, these coalesce into ɲ, and the two words thereby unite; thus, ɛ̀ca, small, and ùʃca, island, become ɛ̀cɲaʃca, a small island. ʻɛca, small, and the affix à, ʻit is,' become ɛ̀cɲa! it is small! Also à means ʻmouth,' and therefore ɛ̀cɲa is also ʻlittle mouth.' Again, when similarly a and w (or ˜) coalesce into ɵ, as ūla, all, and ūʃtaguˌ do, become ūlɵaʃtaguˌ to do all; ūlɵalu, to eat all the crabs, from ūla and ᾱlu. The aspirate in Yahgan, though strong and well observed, is not recognized as a consonant; *i.e.* when it begins a word, the former word, if it ends with a, drops this a before the aspirated a of the following word, just as though there were no aspirate; thus, ɛ̀cʼ áʃa, a little voice; ɛ̀cʼ úʃa, a light wind. A, however, is the only final thus dropped.

Observe well the following consonants which interchange.

Composition of the following Verbs.

Muçi, to go in; manqtsicari, to go out; mɛna, to go down; ucɲa, to go up; ᾱna, to go past; tuūraguˌ to go ashore; cuçi, to go aboard, &c.; aguluˌ to fly, leap, jump, &c.; aguɳmuçi, to fly into, as a bird into a wood; to fall into, as a boy into a hole; to sink into, as a cart in the mire; agu-manqtsicari, to spring or fly out; aguɳmɛna, to fly or spring down; agulʼucɲa, to fly or spring up; aguᾱua, to fly or spring past, to jump over; aguūraguˌ to leap, or fly ashore; aguɳcuçi, to spring aboard; agundeca, to spring or jump or fly across, as a man across a river, from uteca, to put down; aguɳɲcuna, to jump overboard, to alight on the water as a bird; aguūnari, to fly down into or jump into the water, from ūnari, to swim; agundatu,

to make a series of leaps or flights, from dɑtu, to run; ɑguliɲɑl, to fly through the air evenly, from ɪ́nɑ, to walk; ɑgupucu, to fall or spring into the fire, from pucu, to burn; ɑgundecɑ, to spring upon, as a lion on his victim; to leap down, as from a horse, wall, &c.; ɑguŋgɑmɑtɑ, to fail to leap over; ɑguèllɑ, to leap or fly once more. After this manner thousands of verbs are compounded, which multiplies the words of such a pliant language indefinitely, some verbs refusing composition, where others take it. For instance, tɑgu, 'to give,' will not compound with any of the foregoing save the last two. Yet all these compositions must appear as so many words in a language, as many of them stand for totally different words in other languages. Thus ènɑrɑ, 'to gnaw,' makes ènuʃèllɑ, to continue gnawing; ɕɛnuʃèllɑ, to leave unconsumed by gnawing, as dogs the skeleton of an animal; hence, ɕɛnuʃèlɑ signifies a skeleton. Again, èsɑ, 'to chew, becomes ɕɛsɑ, the cheeks, or chewers, which they really are. Again, cīssɑ, 'to pull,' combined with tsɑ̄, hard, makes cīssitsɑ̄, stiff, difficult to bend, inflexible; cīssufcili, slack, easily bent, pliant, soft. The verb cīssɑ, 'to pull or draw,' like a host of other words, enters very largely into composition in the following manner:—Cīsseta, to pull along, to draw on to some place; cīssɑcɪ̨ɑ, to pull up; cīssɑmɛnɑ, to pull down; cīssɑmɑnɑtsicɑri, to pull out; cīssɑmuɕi, to drag in; cīssɑtecɑ, to drag a thing to another, so as to be on it; to drag across; cīsseɑrɑgu, to drag ashore; cīsseɑnɑri, to pull into the water; cīssɑpucu, to pull into the fire; cīsseɑnɑ, to drag past; cīssɑcuɕi, to pull into a boat any living object; cīssɑtupi, to hoist on board; cīssuɑcɑnɑ, to pull down, as trees down a steep bank; cīssuɑlɑ, to pull out, undo, as a piece of knitting; cīssɪ̨ɑʃɑ, to pull over and cove (also cīssɑtɪ̨ɑʃɑ); cīssuɑrɑpu, to pull up, as a boat up a creek, by a line; cīssuispaɑtɑ, pull awry, or so as to be no longer straight; cīssummɑ and cīssummɑtɑ, to rend, tear, to pull to pieces, as a garment; cīssuɑturi, to pull down, as, for instance, the higher yards and masts; cīssuunnɑ, to draw, as a horse does a cart; and so on, *ad libitum*.

Again, verbs are greatly increased in number in the manner in which they take to themselves great numbers of prefixes and affixes.

Verb prefixes indicating going or coming in certain directions.

The Yahgans have verbs (as cɑtɑcɑ, go or come; cuɕi, to go or come by any conveyance, as on horseback, by canoe, or carriage) which have no regard to direction. When, however, the Yahgans

compound the verb *go* with others, as, for instance, 'Go bring me the child;' they then indicate the going and its direction, by prefixes according to the direction; and these prefixes are the prepositions of location, for the most part. Thus, cu, or ci before verbs in y means to go westward to do anything, as acuɨůa sciɨa, I will come and call you. When the direction is east, the prefix is mut or muta or mutɨ, according to the initial of the verb; thus, àmutɨ-ůa means, 1st, I will go and call, from ɨì, to call; 2ndly, I will go and bite, from ůa, to bite;* mutəaʃtukůqmuʃ, he says he will not go to work, from ůʃtaɡu, to work; and mutatɔugun' ɨa, come and stay by me. When the direction is north, the prefix is ma or maɬ, from maɬu; and when it is south, the prefix is cuɬ or cuɬa. Again, when the direction is upward, the prefix is cu or caɡ; thus, cumuɬa, come up and sit, but caɡɨìn ɨa, come up and call me. When downward, the prefix is cup or cupa; when outward, maɲ or mana; when inward, it is mut or muta, as amutamuɬua, I will go in (home) and sit down. These prefixes have other definite applications as well as the above. Thus, the prefixes ci, cu, or caɡ, which mean in composition *only* to go westward, also mean to get up, either when lying or sitting, to do anything. The prefixes mut, muta, also mean to get to do anything well from custom; in this case the verb to which it is prefixed takes the affix ta. Ma or maɬ, besides the meanings given above, also signifies, *as a prefix*, to go or come ashore, to remove from off the fire to its confines, as the hob; thus maɬumuɬ' ɨa səspan, put the kettle for me on the hob, or from off the fire to its confines. Further, they refer to direction to either side of the wigwam, even as the prefix cu refers to its door end, and cu, ci, or caɡ to its upper end. Cuɬ or cuta, as prefixes, further mean to go out, as on a bowsprit, or to the edge of a cliff or branch, to do anything; also to go out from shore, whatever the direction.

These prefixes form a most important part of the language; and as they are all used with every verb, simple or compound, they again multiply words without limit.

Adverbial Verb Prefixes.

These are, according to the initial letters of verbs, either t, ts, tu. I need not instance further than to remark on the form in tumu that,

* Here the two verbs ɨì, to call, and ůa, to bite, in composition and inflection become alike, as is often the case, as with acu and taɡu, ucu and tucu, &c.

it is equivalent to asking, telling, or getting another, either actively or passively, to do something for one. Now in Yahgan there is of course a verb çɛqli or gɛqligu, to tell to order; but when the ordering is for oneself this verb *cannot* be used, but the prefix tɛmu takes its place. Thus, áçɛqli gɨsinanɛa sɛɨa cunjima, I will tell him to help you, but átɛmugɨsinanɛa cunjima, I will get or ask or tell him to help me; cutɛmugɨsinanɛamuʃ sɛɨa, he said he will ask you to help him; satɛmugɨsinanɛamuʃ ɨa, you are, he said, to have me to help you.

Other Prefixes and Affixes

Are almost inexhaustible, but I will only mention a few more. Āgu as an affix means one's own, or for oneself, and ɑ̀gu, for, on behalf of, another; thus, tɛmukɑ̀gu, to sew for another; tumacɑgu, to sew for oneself. Ɛɑnara means much the same as ɑ̀gu; thus, tɛmuʃɑnara-tɛmacɛa sa ɨa, you had better get me to sew it for you. Similarly to ʃɑnara, mɑnara is used, and means to do, without reference to others, independently of others. Acu, from aci, to strike, means, as a verb prefix, to do with a blow of the hand, or any weapon or tool; hence, acutasana, to trim a tree of its branches, to roughly shapen anything with an axe. Acupuna, to kill with a blow; acuaʃaata, to break off or in two with a blow, to chop off or in twain, to chop through. Similarly, dɑgu means to do with the hand, as dɑgutɜq̄na, to hold firmly; dɑgutɑsana, to clear with the hand; dɑgupuna, to put down a person in wrestling, to thus throw down; gɨ, (1) to do anything with a point, as by poking, sticking; (2) to do by the action of the sun or moon, &c.; gɨpuna, to kill by a thrust; gɨata, to spear a crab or other object, and so get it; gɨbɑcɑna, to dry as the sun. The prefix la, or l before vowels, means as well as others; *i.e.* besides them, too, also, in return, in reply to.

The prefix 'la,' which always immediately follows the pronominal prefix, indicates doubt, and answers to our words, perhaps, think, may be, its likely; álalacɑtacɛa, I think I will also go. Here the 'la' is 'think,' the 'la' is 'also.' Ula or ulap, before vowels, signify dissuasion or negation. With a future negative it means not, and becomes "éla sula" in the 1st and 2nd pers. sing.; thus: élap aciūk, I will not strike; sulap aciūk, you shall not strike; ulap aciūk, he will not strike. Ula or ulap, further signifies, to do without being told, of one's own mind, on one's own responsibility; thus, átula tɑgua, I'll nevertheless give, or I think I had better give;

éląp atų ɤan! I had better take this! or, am I to take this? Tų prefixed to verbs, signifies to cause, induce, make, to accuse, say, infer; thus: ɟa sa tųacida cunjima, you caused me to hit him; tųtąʃaneɑ sa ɤan, put a head here (as in a picture); cumųdų' ɟa sa tųʃūūnatuda? why did you accuse me of being proud? tų-ula, to give to drink, also to drench, make drink; tųatama, to give to eat; tųsągana, to inflict pain, to give pain, to hurt, from the intrans. verb 'sągana,' to pain. Mų, as a prefix, signifies, to make or cause oneself, as mųamáʃągu, to abstain from food, to make oneself hungry; mųturina, to cool oneself. Tų, prefixed to the above mų, signifies together, to cause another to do for oneself; as, átųmųtų-cusida scɟa, I asked you to wash me; átųmųatuda, I let (him) catch me; cutųmųatɑamuʃ scɟa, he says he will let you catch him. Ā, as a prefix, signifies may, might, could, would, ought; Sa ācątaceɑ, you ought to go. It also means 'still,' as ą̄ āmųta, I am still; cu āmųt' ɤan, he is still (sitting) here. 'Á,' as a verb prefix, signifies, what has been, a former but not present state; thus: ɟ átąguda, I was going to give, or I would have given; saà-tągaʃinçit' ɤan, this is just like what you gave (me), meaning that the thing given, is no longer in possession; sa ų̀cɟda étųl uʃcaìnų, you would have gone up, if I had not forbidden you; here the ` over the ų, is the representative of the prefix à. The prefixes ç or çi refer to the time, place or other circumstances of the action, and are to be variously rendered by *then, there.*

Verbs beginning with m, cų, or gu, p, and ¯, require tų; verbs in c, g, unless followed by ų, require ç; those in s, ʃ, ç, l, and ˛, require çi or çɛ; those in t or d, require ts. A few examples:—Verbs beginning with vowels, simply take t; thus, tųca, from ųca, to sew a canoe, to sew then or there; also to use for sewing; hence, any article or material used in this work; again, tstųcusi, to wash at any time or place, to use for washing, from tųcusi, to wash, trans. verb; tųmųcusi, to wash oneself at any time or place, to use for this object; hence, vessel or soap, flannel or water, used in this work; also, the place or time of the action, and so on with the rest.

These prefixes are also used, and make a total difference in the verb; thus: atųèlla, to eat more, to go on eating, to eat again, but tątuèlla, to leave uneaten, to leave off eating, hence, remnants of a meal; again, with the affix gąmata, Tɟìkgąmata, to put things in place of other things; but tstɟìkgąmata, to put in things with, or on top of, or in addition to, what were there before; dufgąmata, to put on a garment

instead of another; tsdufgqmata, to put on a garment in addition to, or on top of another, and so on in numberless cases.

Reflective and passive forms of verbs are formed by prefixing m, ma, ma, or mu to the verb, according to its initial letter; thus: tucusi, trans., is mucusi, to wash oneself; and tumucusi, to be washed. Ufagu, to cut, becomes mafagu, to cut oneself; tumuafagu, to be, or get cut; thus: átufaguа scia ufta, I will cut your hair; ámafaguda ufta, I cut my own hair; átumuafaguda, I had my (hair) cut; ámafaguda maam, I cut myself.

Verb affixes, are such as take the tense endings. These, like the verb prefixes, which take pronominal prefixes, are very numerous, and I can here only enumerate a few; they are of great consequence to the language, and are largely made up of verbs. 1st. Ata or ta, as an affix from ata, 'to take one in the hand,' has many uses and meanings. Affixed to such verbs as these following, it means, to take; Dupa, to put on oneself any article, such as a cloak, coat, vest, shawl, shirt, &c.; dupata, to take away by wearing any such article; cili, shoes or boots; cilina, to boot or shoe oneself; cilinata, to take away on one's feet; muci, to wear on one's head, or to put on a cap or wreath; mucaata, to take away any such thing on one's head; magu, to wear round one's neck, as any necklace, or neck band; mugata, to wear or take away round one's neck; ategа, to row, or paddle; tatugata, to bring, fetch, or take away, a canoe or boat, by paddling it. The above words also mean to fetch or bring, as well as to take away. With other verbs, this affix conveys the idea of reaching to, arriving at; as, atugata, to come to by canoe, from ategа; illaata, to dip one's body when bathing, to be or get in a bath, either by sweating, or a soaking rain; detata, to catch up to in running, also to catch as a runner; atugata also means to catch up to, as one canoe to another; detata from datu, to run. The use of the objectively singular verbs in ata saves the use of the neuter pronoun *it*, for which the termination ata serves; thus; usatɔena, pluck it (a feather) out, from usû, to pluck; átumugatoa, I will sew it, from tumaca, to sew, and gumugata, to plait it, from gumaca, to plait. Ata or ta also in many cases further conveys the idea of finishing off, as in the last two cases, and also in these following: Ûftegata, to finish, from uftagu, to do; usata, to finish off a basket, from usû, to pull out; lupata, to finish off a canoe, from lapu, to make a canoe; ufaata, to turn or drive back, from uffi, to drive; tullaata, to overtake, catch, from tulli, to drive; ufugata, to sever, to cut off one, from ufagu, to cut.

I have before instanced the use of the affixes gqmata and èlla, with and without the adverbial prefixes. Èlla, when èca follows, signifies to do a little more, or a little longer; as, atuèlloa sa èca, eat a little more; ulèlloa sa èca, drink a little more; ūʃtukèlloa sa èca, work a little longer; cutaèlloa sa èca, say a few more words. Many instances have already been stated where a verb compounded with another as its affix serves as an adverb; as, for instance, atuk-ā̀na, to paddle past; dur-ā̀na, to run past; mana-dur-ā̀na, to run through, as through a tunnel; man-uk-ā̀na (from ucu, to throw a spear, or shoot an arrow), to throw through, to shoot through; tupoamuçi, to cast into, as a dead dog into a hole: maniɲa, to walk about; tullaɲa, to chase hither and thither; muçaɲa, to wander about from house to house, to go in and out; tecidqtu, to step from stone to stone, as when fording a stream.

The affixes, mutu, muni, palana, magqtu, ɲa, cuna, ēa, teca or deca, are very extensively used, and have various meanings, according to circumstances; thus: cumukmuta-cun uʃ ʒa tucun, she who is seated and has ush (bone necklace) round her neck, is my wife; ámuk-muta sina, I am wearing your necklace; cunna mukmu^{t}' ʒa? who is wearing my (necklace)? cunna cutqmutu? who is sitting talking? cutqmuni, to continue talking, to speak generally; cutqnea, to speak when lying down, also to persist in speaking; ūʃtqgēoasa, continue to work, = ūʃtukmunù̇a sa. Cuna, as an affix, means to be afloat, or on the water, as átucutaŋ-cunuda sin' qnan, I spoke when I was in your boat, or I spoke from your boat; cunna cutanɲuda? who was that who spoke as he walked? tɲìk-teca, to put down in readiness for a person some things in a vessel, as a wife might berries in a cup for her husband; tumukteca, to sew on as a patch, to sew and put down or away, as one does a garment one has finished. Ecamandeca, to write upon; moanariteca, to swim ashore; qgundeca, to jump across; atukteca, to ground as a boat when rowed to shore; also to come or be come ashore.

Joining of verb to verb is a great peculiarity of Yahgan, by which the structure of sentences is greatly simplified; thus: I will go up and (tell him to) tell my wife to teach you to make baskets, ácuçcqli-tɛaʃmqnun-ɟetanoa ʒa tucunçicɲa scɲa. Cupqgiqqgul-tɲìgun ɟa potatoz, go down, dig out and fill for me some potatoes; ácutu-muɲaminoa cunjima, I will go up and ask him to give me some work to do.

Adverbs, Prepositions, Conjunctions and Interjections.

As they are so largely (together with prepositions) supplied by prefixes and affixes, so we find distinctive adverbs and prepositions few. Yet they are important parts of this language. They sometimes come before, sometimes after, the verb. Here are a few: Ulqf, for nothing, for no special object or reason, freely, in vain, for nought; ulqf-culqf and ulqf-culqf-ulqpūn and ɛɪtamaguta are very similar in meaning to the above. Cɛdamaʃu!=cɛmaam! which mean 'wonderful!' it was very wonderful; thus, cɛmaam átiŋuda, it was a great wonder that I managed to walk, as a person might say who encountered very great difficulty or danger in so doing; cuttacun! as cuttacun átiŋuda! how cleverly, wonderfully, I walked! ciɔa, quickly; ʠʃu, slowly; ʝma, well. Almost all adjectives can be used adverbially. 'Uʃmanu ūʃtagu, to do anything cleverly; unnaco aʃtagu or ūʃtagunnacana, to do anything badly; istumula giama, to dig deeply; arugat-oaʃtagu, to do badly or awkwardly; èceaʃtagu, to do a little, or in small measure; ámuabil oaʃtagua suan, I will do that work with vigour; ámuasinan-iamaceɑ, I will fight bravely; mussūāt'-oaʃagu, to do anything lazily.

Adverbs of Place.

Etu, enu, iŋgu, elu, eastward, westward, northward, southward; eta, inna, iŋga, ela, there, position in a place east, west, north, south respectively. In English we use indefinitely for these beautifully distinct words "over there, there, across there, yonder, up, down there," and point or look in the direction indicated. These Yahgan terms need no such help. Etacupi, enacupi, iŋgugupi, elucupi, on the east, west, north, south side or end of; also, behind, on the other or this side of, according as it is north, south, east, or west of it. These last four words are also adjectives, as elucupi ūʃa, the south shore. Similarly with the above, and by us so indefinitely rendered by "up there, down there, over there, across there, yonder," &c., Yahgan has a series of words indicative of the relative positions of things; thus: ɛt ʂacillu, ɛt ʂamuçi, in ʂacagu, iŋg' ʂamatu, ɛl ʂagutatu, ɛta siŋgilllu, ɛta simuçi, inna scagu, iŋga simatu, ɛla scutatu; also ur' oagu and uru scu, uʃ ʂacapu and uʃʃa scapu, ʂacillupi, ʂamuçipʃ, ʂamatupi, ʂagupi, ʂagutamapi, ʂacagupi, siŋgillupi, simuçipi, simatupi, scupi, stamatupi, scagupi; uʃʃugupi, on the upper or inner side of; ɛlucupi, on the outer or sea side of; ɛtalum, innalum, iŋgalum, ɛlalum, uralum, uʃʃalum, from the

east, west, north, south, west (when near), the upper end of. In close connection with the above are the following words: Cupịa-mutacun, the easternmost (island); cịàmatacun, the westernmost; cɛ̄amatacun, the westernmost; maamatacun, the northernmost; urugupịndɔlum, uʃugupịndɔlum, etacupịndɔlum, enucupịndɔlum. iŋgugupịndɔlum, ɛlucupịndɔlum, from the west upper, east, west, north, and south side of; etacunupị, inward, under, underneath, downward, in underneath; q̄ganupị, upward, up; asipị, outward, outside; iscɛpị, at the back of; uʃpan, last, behind; ùn, first in front of, at the head of; ị̄a, a verb prefix signifying 'first;' thus, áị̄a-dqtua, I will run first; asin, out, outside; q̄gun, on, above, over; ɛtacun, in, inside, under.

Prepositions follow the nouns they affect; thus: ucurcqgu, above the house, on the higher side of the house; ucurcillu, below, on the lower or beach side of the house; ucurmqtu, on the north side of the house; ucurmuçi, on the east side of the house; ucurcutqtu, on the south side of the house; ucat-asin, outside the house; ucur-q̄gun, over, on top of the house.

Conjunctions are few, and are used as follows: he *and* I, cun-da ípị; they and I, cundịan ʃan; James and John, Jamz Jon'nda; James, John, and Henry, Jamz, Jon, Énri ndịan; ácun, also, and; as, ɤan ácun, and this; James and I, Jamz nda ípị; James, John, and I, Jamz, Jon-ndịan ʃan; so also, John and he, Jon nda cunda; John, James, and he, Jon, Jamz ndịan cundịan; James and you, Jamz nda sapị; James, John, and you, Jamz Jon ndịan san. Mutta, but, used when contrasting: but I am well, ị́ mutta ʃma.

Addenda.

When I began these remarks on Yahgan it was not my intention to have gone so fully into it, and I find the former part is much briefer than the latter. I will therefore make a few additions.

Terms for the phases of the moon: Āru cutɛa, the new moon; lit. now returning southward, the new moon being in the north, but beginning to march southward; patuk, or cupqpataguna, full moon, referring to its width; also, ɤūlqcɛpa. These are all. Two other words mean 'moon,' as, ánnuca and únian. For many things there is a redundancy of terms; for others, terms are wanting; thus, there is no word for 'parent,' the one word tucu answers for 'husband' and 'wife,' cunjin for 'he' and 'she,' ùʃ for 'hand' or 'finger;' a child or baby (male), cịùala, cuʃana, ʃula, àmumatra, ʃatacumara; a

child or baby (female), cɟù̱alqcɛpa, cuʃanqcɛpa, ʃulqcɛpa, ʃatacumarqcɛpa. Lum, the sun, also istecus. (ðì, ɟùf, stone.) All vegetable productions which attract notice either as a nuisance or a blessing have names; but others have no names. The different grasses have distinctive terms, and one general term. The word ūrur, which properly means 'the stem or trunk of a tree,' has to serve for 'tree' also,* there being no other word; yet there is a word for 'a log,' which is gulla, and 'a drifted tree trunk' is ummuk. For the foliage of trees they have distinctive terms; thus: ánis, the foliage of *Fagus antarcticus*, and ʃupɟa, the foliage of the evergreen beech, and uʃcuttq lɛuʃ, that of the uʃcutta or winter's bark, and lɛuʃ, that of the *Leñadura*. Muʃqqna is the large leaves of a marsh plant; ʃqna, a giant moss which grows in ʃqnas or flats, and used as a washing material. For every kind of bird they have distinctive terms, as also for animals and insects. They recognize many kinds of kelp, for which they have terms; thus: ðuʃ, kelp generally; aɋik, the true kelp; ʃoun, leathery kelp; pɟaʃa, a kind of kelp; ūʃuma, drift kelp; purri, green seaweed.

Whilst the Yahgans have no numbers beyond 3, it seems to me that they formerly had, from three words, now used indefinitely:—èla, a few, some, more than three; cupaʃpa, the lower or last finger; and patak, all, all gone, the last. It seems to me that these were originally the numbers 4, 5, and 10. Were the other numbers (6, 7, 8, and 9) forthcoming, I would have adopted the former; but as it is impossible to concoct these, we must also let the others drop. The terms ūru, meqgu, àmali, lusi, bundasuiçi, all have reference to indefinite quantities, meaning 'many' and 'few' in different degrees. The Yahgans have no divisions of time, no words for 'year,' 'month,' &c., no divisions of space or weight; yet they have terms indicative of the seasons, and what is in season; thus, besides cɛsi, ánisluʃ (red leaves), ɛna, and arina, 'summer,' 'autumn,' 'winter,' and 'spring,' they used other terms. There are no terms for parts of a thing; it is impossible, for instance, to say 'two and a half,' or 'two halves,' 'a third,' 'a quarter.'

A sample of verbs made from adjectives:—Patuk, broad or wide; patagundeca, to decrease in height, to fall abroad, widen out; patagunata, to get wide or broad; tupatagunata, to spread, extend,

* Though there is no special word for tree, yet when speaking of it with respect to its wood it is called ūrur, but when with respect to its foliage it is called ánis or fulçi.

stretch; upatagumuni, to let stay in a broad state, not to make narrower, or remove what is broad; upataguèlla, to make wider, to flatten out a little more; acupataguna, to flatten with a blow or with the hand; dagupataguna, to spread out, to hold out or down, and thus make flat; patagunçuna, to be on the water extended (said of any flat or spread object); patagumuni and patagunea, said of any flat or spread-out object.

A List of Kindred.

My	Your	His or Her	
'Edabuan	dabua	ciçimun, or	father
'D'emun	sin' emun	cunjimin eusun	
Cuteas, tanuā, dsā	usuma		
'Edabaan	dabja, or sina dabin	cedabin, or cunjimin dabin	mother
Cuteascepa			
Tanuācepa			
'Da tucun	sa-tucun	cetucun	husband or wife
Da macepan	sa-macepan	cemacepan	daughter
'Da macun	sa-macun	cemacun	son
Dalan, or da īm	jamun	cùjamun	elder brother
Inni, or daīcepan	sin īcepan	cùjcepan	elder sister
Usuā, da macus	usuūrin, sin macusin	cetusuān, cemacusin	younger brother
'Dusçepan, da macuscepan	sin usçepan, sin macuscepan	cetusçepan, cemacuscepan	younger sister
'Eecadabin	èca dabja	ceecadabin	aunt's mother's sister
'Edamapuan	damapua	cedamapun	aunt's father's sister
Immanan	sin imman	cicimanan	uncle's mother's brother
'D'indarūān	sin darūān	cicindarūān	uncle's father's brother
'Da āturun	sin ātarun	cùataran	nephew's sister's son
'Da àmanamacun	sin àmanamacun	ceamanamacun	nephew's brother's son
'Ecepeaturun	sa cepeaturun	cecepeaturun	niece's sister's daughter
'Da àmanamacepan	sa àmanamacepan	ceamanamacepan	niece's brother's daugther
'D'usun	usuan	cetusun	grandfather
'Da gulyanan	sina gulyanan	cicin gulyanan	grandmother
'Da macytasa	sa macytasa	cemacytasan	grandson
Da macytasacepan	sa macytasacepan	cemucytasacepan	granddaughter

My.	Your.	His or her.	
'Ɔaⁿdąʃinaca	saⁿ dąʃinacan	cɛdąʃinąca	cousin (male)
'Ɔaⁿdąʃinacącɛpan	saⁿ dąʃinacącɛpan	cɛdąʃinacącɛpan	cousin (female)
'Ɔaⁿmasągun	saⁿ masągun	cɛmasągun	father-in-law
'Ɔaⁿmasącɛpan	saⁿ masącɛpan	cɛmasącɛpan	mother-in-law
'Ɔaⁿmasągūinni	saⁿ masągūinni	cɛmasągūinni	daughter-in-law
'Ɔ alamun	sin' alamun	cɛtalamun	brother-in-law
'Ɔaⁿcɛpalamun	sinaⁿ cɛpalamun	cɛcɛpalamun	sister-in-law
'Ɔaⁿtųmągų-dąrųān	saⁿ tųmągųdąrųān	cɛtųmągųdąrųān	step-father
'Ɔaⁿtųmągųdąrącɛpan	saⁿ tųmągų, &c.	cɛtųmągų, &c.	step-mother
'Ɔaⁿtųmągun	saⁿ tųmągun	cɛtųmągun	step-son
'Ɔaⁿtųmącɛpan	saⁿ tųmącɛpan	cɛtųmącɛpan	step-daughter

[*For further notes with bibliography see* "Mission Scientifique du Cap Horn," 1882–3, vol. vii. (Paris: Gauthier-Villars, 1891.)]

Some Notes on Native West African Customs.

By G. F. Scott Elliot, M.A., F.L.S.

I was attached to the Sierra Leone Boundary Commission as botanist, and in the course of our journey along the boundary of the English and French spheres of influence at Sierra Leone, noticed a few traits and customs which may be worth writing down.

The general life of the people is remarkably similar throughout this district, which extends from Mahela, at the mouth of the Scarcies River to Farana, on the Niger, about 10° N. latitude.

Rice, cassada, and pigeon pea are the main articles of diet. It is beaten out in wooden mortars by women by means of a smooth pole about 5 feet long and 3 inches in diameter, which is raised 2 or 3 feet by both hands and then let fall.

Their dress is universally the cotton cloths made by themselves out of the plants grown in almost every village; it is carded by an instrument, probably imported, which is very much like a wire brush about 8 inches by 9 inches and woven on an ingenious loom.

The cotton is dyed blue by indigo, which is largely cultivated for this purpose, and is often marked by a white pattern produced by tying portions of the cloth together before dipping it in the

solution. The dress of girls from the age of ten to puberty consists very often of a string round the waist with a small piece of leather in front and a long tail made of string behind.

The dancing dress of the women is very elaborate, often of velvet or ornamental cloth, spotted or striped cotton or tartans; sometimes the skirt is ornamented with small bells which are made to sound in time to the music, and on these occasions a band is fastened across the breast. In ordinary life the women wear a single cloth, which is either folded round and tucked in under the armpits or more usually round the waist, leaving the breast exposed.

Amongst the Fulas, the hair is dressed in a very elaborate fashion.

The houses are usually circular, and the walls are made of dried mud which is coated inside with fresh cow dung, and often varnished by the juice of a plant called yetté (*Ophiocaulon cissampeloides*). Inside, these huts have often raised benches, seats, rice jars, and beds made of dried mud like the walls.

The roof is of thatched grass, and is supported on rafters which project 6 or 5 feet beyond the wall, and are supported in part by a row of upright sticks at about this distance from it; there is therefore, a circular verandah outside the hut which is often made into little rooms outside the large central apartment. This form of hut is both cool and fairly rain-proof, and well adapted to the country.

The laws of the people are chiefly Mahommedan in origin, and display but little variety so far as I saw. They seem to have a king in every village, and are, as a rule, very faithful to him; his power does not seem great, and he seems mainly to act as judge and mediator in their quarrels. There is always an orator attached to every chief, who does the speaking, and every village has its council house or palaver house. Oratory is in fact their main amusement.

The marriage laws are simple, and divorce is produced by the husband simply telling the wife to go home, or by the wife leaving the husband of her own accord. Slaves are held universally, but are usually well treated and allowed to work two or three days a week on their own account.

Circumcision is accompanied by various ceremonies, and during their course both sexes remain in the bush and do not mix with ordinary life until it is complete. There is a great deal of music and dancing when it is over. At Kofin I saw this going on, and noticed an instrument which I saw nowhere else. This consisted of eight or nine perforated discs of wood about the size of a five franc piece, which were made to rattle on the string of a wooden bow. The three girls who were performing were handsomely dressed and carried white wands about 5 feet long, often with a bell at the top; these were stamped all over the ground inside and outside the hut with great energy, with apparently the object of thumping every part of the floor so as presumably to

induce the evil spirits to lie down quietly below. A young man seemed to direct the ceremony, which apparently went on night and day with intervals for rest. The ceremony for boys seemed very similar.

Property in land goes apparently by families, and is quite definitely owned. At first sight one would suppose that the fields of every village are owned in common, but this is not the case; the climate is so favourable, and the population through wars and slavery so low, that there is usually an abundance of food, and anyone who is hungry goes to the field and takes what he requires anywhere. But if there is famine or scarcity, the rights of the different families are carefully maintained.

As far as religion is concerned it is very difficult to form any idea of what the natives believe. One often sees little offerings and curios attached to a particular tree, and in the fields there is often a miniature hut 2 or 3 feet high, which contains various teeth and other things supposed to propitiate spirits. The wearing of amulets on the arm or neck is very common even with educated natives, and in the Limba country every hut contains various odd and peculiar things of wire and shells, &c., which are supposed to keep it free of devils.

The gall of the crocodile is supposed everywhere to have magical properties and to be intensely poisonous, and none can be skinned without the presence of a chief's deputy to get this substance.

Mahommedanism is, however, rapidly overspreading the country, and these superstitions will probably soon die out.

The Yalunka people at Falaba and the various villages from this place to Farana on the Niger, are the remnants of a tribe which appear to have once been both numerous and powerful.

The villages above referred to appear to have been before the advent of the Sofas large and populous towns; the ruins of some are at least a mile in diameter, and at least four must have been once inhabited by 10,000 people each. Now there are at the most favourable computation a very few hundred of these people remaining; as will be seen from the language, they seem to be of Mandingo stock, an addition of "ina" or "na" to the words of the Sofa language being practically all the difference existing at present.

Their history is a very common one in this part of Africa; after having established themselves along this road, which is the main highway to the interior, they became rich and powerful, and were great obstacles to the passage of caravans. They used to detain and plunder any traders passing through, and being at a lower altitude and in a more unhealthy locality than the interior tribes, were unable to resist the latter, who annexed their wealth and occupied the country.

They are not Mahommedans, and seem to be permitted by the Sofas to subsist on the condition of living practically in slavery and assisting them in every way.

They worship devils, and in particular one special divinity which resides in a certain stream a few miles from Falaba; we were invited to witness a function on this spot, and according to report sacrifices of cloth and beads were thrown into the water and disappeared. Our interpreter told me that they believe in a future life, and when anyone is buried pray at the grave that he may be shown the road to heaven, provided he has done good in his lifetime. They are polygamists, and the marriage ceremony is simply one of consent by both parties. At present they are in a very degraded condition; disease of syphilitic origin and drunkenness is very common amongst them, and they will probably soon disappear altogether. Their only good quality seems to be that they are industrious and they display some skill in iron-working, but this latter pursuit is practically destroyed by the presence of the Sofas as lords of the country.

Thus their history may be summed up as follows; an offshoot of the powerful, healthy Mandingos before the latter became Mahommedan, increasing to a population of certainly 200,000, and becoming wealthy by their position on the trade route and their own industry, then becoming corrupt and physically degraded, they fell an easy prey to the Sofa robber hordes, and are now rapidly vanishing out of existence.

This is really a summary of the regular course of events in all the numerous tribes on the west coast, and affords a commentary on the character of Arab rule which is of immense value at present.

(*The MS. Vocabularies which accompany this Paper may be consulted at the rooms of the Institute.*)

On Some Matabele Customs.

By Lionel Decle.

Chargé de Mission Scientifique du Gouvernement Français.

Marriages.

Polygamy is the rule amongst the Matabeles, and the King Lo Bengula has eighty-four wives. The marriage ceremonies and customs differ greatly from those observed by the other South African tribes. When the father of the girl has given his permission to the marriage, the intended husband kills an ox or a sheep, according to his means, and sends or takes part of it to the village of the young woman's father; coming outside the hut, where the latter lives, he screams out "Here is meat for your child." The young men of the town then come out and drive the herald away, but he is soon brought back and every one feasts on the meat.

When the girl goes to her husband, most of the young girls of the village accompany her. Sometimes, when he is wealthy enough, her father gives her an ox or a cow to take with her, and when she comes to her husband's place she has to take some dung of the animal presenting it to the bridegroom, who washes his hands with it. The bride must also bring with her a kalabash filled with water and beads, and when she comes into her future husband's house she pours water over him and his people and puts the beads on her head; then, placing the kalabash in front of the bridegroom, she smashes it with her foot: this seals the marriage.[1]

The girls who have accompanied her are supplied with places of rest; the bridegroom slaughters an animal, and a dance with beer drinking takes place that night and the following day. The day after the bridesmaids go and collect wood in the veldt in the morning, the husband gives them a goat to eat, and then they go home.

Contrary to the custom of most African races the husband does not here pay for his wife before marrying her, but when his wife bears a child it belongs to her father unless her husband pays to his father-in-law cattle varying in number according to his means. Sometimes—although this is seldom the case—a man will go and ask for a girl, giving then cattle to her father, but that does not dispense with the usual payment after the child is born.

When a woman is childless her husband has a right to claim her sister or her next nearest relation. No relations are allowed to marry unless very distant—but the relationship is only considered on the man's side; in fact the rule is against marrying anyone with the same "isibango" (surname); for instance, a Kumalo cannot marry a Kumalo.

Another custom is most strictly observed: a man can never look at his mother-in-law or at his wife's aunt, neither can a woman look at her father-in-law. A man can also send one of his wives away if he does not like her, and she can then marry another man.

Before marriage women are allowed all freedom. When a man is dead his widows usually become his brother's wives, although it is not compulsory on the women; and if they choose they can marry again, but in that case the new husband must pay his father-in-law if a child is born.

Burials.

As soon as a Matabele is dead his relations tie the corpse in a blanket or a skin in a sitting position. The relations cry and howl, and the people in the village come and join them. A grave is dug outside the village—there is no special place of burial—which is covered with stones and bushes.

After the funeral the near relations and whoever has come in contact with the corpse must go out of the town and stay away for

[1] This custom only takes place in the case of a young girl being married.

several days until they have been doctored and cleansed. Every town has separate huts outside for this purpose.

As a rule they get the dying person out of his house into a small hut to die there.

If a man of importance dies the people from all the surrounding villages come and cry for him: they cry and howl on arriving and on departing only.

The different tribes under King Lewanika on the Upper Zambesi are :—[1]

Lat. 15° 10′ S., Long. 23° 7′ E.	In the Lialui Valley (Barutse proper)	Marutse (reigning tribe). Mambunda (mixed with the above, originally from North-west).
Lat. 17° 10′ S., Long. 24° 20′ E.	Near the sources of the Ndjoko River	Monkoïa.
Lat. 15° S., Long. 22° E.	North-west of the Barutse, on right bank of Zambesi	Balubale.
Lat. 17° 10′ S., Long. 24° 20′ E.	North and north-west of Shesheki ...	Matotela (slave tribe).
Lat. 17° 40′ S., Long. 25° 30′ E.	North of Victoria Falls	Matoka, amongst whom are also found Baleas.
Lat. 17° 55′ S., Long. 26° E.	East of Victoria Falls	Mananza.
Lat. 16° S., Long. 26° E.	North of Baloka country, between these and the Mashukolumbwes ...	Matombe.
Lat. 15° 30′ S., Long. 26° E.	North of Matombes	Mashukolumbwe.
Lat. 17° 35′ S. Long. 25° 30′ E.	Near the junction of the Lynyanti with the Zambesi	Masubia, some of whom are called Mashokotuani.

There is also a nomadic tribe, the Makwenzo, the Bushmen of the north of the Zambesi, whilst on the south they are called Masarwa.

[1] The geographical positions are approximate.

MEASUREMENTS OF NATIVES FROM THE UPPER ZAMBESI.

The Nos. of the measurements are those given in Chap. II of the "Anthropological Notes and Queries" of the British Association (1st Ed. 1874).

1. Height of vertex from ground.
5. Height of umbilicus from ground.
7. Height of fork from ground.
13. Height when sitting on ground.
14. Breadth of shoulders (*i.e.*, between the acromia).
16. Circumference of chest at armpit.
18. Circumference of haunches.
20. Circumference of neck.
21. Circumference of waist.
26. Fathom or span of outstretched arms.
30. Head; greatest circumference from the glabella.
31. Arc from notch at root of nose to inion.
34. Greatest length from glabella backwards.

No. of Subject.	Tribe.	1	5	7	13	14	16	18	20	21
		ft. ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.	ins.
1	Marutse	5 6	—	—	—	—	36¾	—	15	—
3	* ,, ...	5 9½	—	—	—	—	34½	33	14	30½
4	Masubia, about 25 years old	66¾	39½	30	34	—	33½	33	12¼	29
5	*Marutse, ,, 28 ,, ..	71	43	31	34½	—	35	36	12⅞	30
6	Masubia, ,, 25 to 30 ,, ..	68½	40¾	30	34	10 (correct)	35	33	12⅞	31
7	*Masubia, ,, 35 ,, ..	66¼	39	30	31½	8¼	33½	30½	12½	30
8	*Monkoïa, ,, 30 ,, ..	66	42	34	31	6½	33½	32¼	13⅛	27¾
9	*Monkoïa, ,, 22 ,, ..	66	40¼	31	32½	4¼	32⅞	33	13	28
10	*Masubia, ,, 22 to 24 ,, ..	70	40¾	33	33½	5½	35¾	33	13⅜	29½
11	*Mashokotuani, ,, 25 to 28 ,, ..	66	39½	30	33	6½	34	32½	12½	29
12	*Monkoïa, ,, 28 ,, ..	68	42	33	31	4½	35¾	34½	13⅛ (short)	28
13	*Monkoïa, ,, 20 ,, ..	67½	42	34	31	5½	30⅞	32	12½ (4″ long)	28½
14	*Masubia, ,, 25 ,, ..	70	43½	35	32	7	34½	34½	12⅝ (3¼″lng.)	29¾
15	*Masubia (chief), ,, 35 ,, ..	69½	—	—	—	—	32	—	12½	28

The subjects marked * have been sketched.

The subjects marked * have been sketched.

MEASUREMENTS OF NATIVES—*continued.*

No. of Subject.	TRIBE.	26	30	31	34	Width of mouth.	Width of nose.
		ins.	ins.	ins.	ins.	ins.	ins.
1	Marutse	—	24	—	—	—	—
4	Masubia, about 25 years old	67½	22¾	15½	22⅝	—	—
5	*Marutse, „ 28 „ ..	72	24¼	17	23½	—	—
6	Masubia, „ 25 to 30 „ ..	72¼	22¾	16⅜	22⅛	—	—
7	*Masubia, „ 35 „ ..	69	22⅜	16⅛	22⅛	—	—
8	*Monkoïa, „ 30 „ ..	70	22	15	22⅝	1⅞	1½
9	*Monkoïa, „ 22 „ ..	68	22¾	15	22½ touches ear.	2⅛	1¾
10	*Masubia, „ 22 to 24 „ ..	76½	23⅝	16	22 ear much above ¼″	2½	1¾
11	*Mashokotuani, „ 25 to 28 „ ..	66¾	21¾	16	22 touches ear.	2	1⅝
12	*Monkoïa, „ 28 „ ..	72¾	22¾	16	23¼	2½ much projecting	1¾
13	*Monkoïa, 20 „ ..	67½	23	15⅝	23	2½	1¾
14	*Masubia, „ 25 „ ..	73¾	21⅞	15½	21½ ¼″ above line.	2¼	1⅞
15	*Masubia (chief), „ 35 „ ..	74	21½	13½	21½	2½	1½

MEASUREMENTS OF NATIVES—*continued.*

No. of Subject.	TRIBE.	Wrist.	Colour. Broca's Nos.	Eyes. Broca's Nos.	Hair. Broca's Nos.	Teeth.	Beard.
		ins.					
4	Masubia, about 25 years old	—	35	1	27	filed	None.
5	*Marutse, „ 28 „ ..	—	28	16	27	„	Moustache and small beard on chin.
6	Masubia, „ 25 to 30 „ ..	—	35	11	34	„	Do. do.
7	*Masubia, „ 35 „ ..	—	35	11	41	„	Do. do.
8	*Monkoïa, „ 30 „ ..	6¼	27	1	41	„	Do. do., with a little on sides.
9	*Monkoïa, „ 22 „ ..	6	27	between 1 & 2	34	„	No beard.
10	*Masubia, „ 22 to 24 „ ..	6¼	27	1	41	„	Do.
11	*Mashokotuani, „ 25 to 28 „ ..	5¾	27	1	41	„	Smallmoustache and chin beard.
12	*Monkoïa, „ 28 „ ..	6¾	27	2	41	„	Do. do.
13	*Monkoïa, „ 20 „ ..	6¼	27	1	34	„	None.
14	*Masubia, „ 25 „ ..	5⅞	27	1	34	„	Chin beard shaven off.
15	*Masubia (chief), „ 35 „ ..	5⅝	27	1	34	„	Chin beard pretty thick.

SPECIAL NOTES ON ABOVE.—Every one of these, except No. 11, had splendid teeth. The way in which the teeth are filed is the following; for instance:—No. 4, No. 5, . The Matolelas and Malokas usually knock off two of their upper teeth, and sometimes also the two lower ones in the centre.

Diagrams of feet have also been taken.

Note on the Jacoons.

By F. A. Swettenham.

In Selangor, but more especially in the Ulu Bernam and Ulu Slim, there are numbers of the "Orang Utan" or "Jungle People," known also to the Malays as "Sakai," "Semang," "Orang Bukit," and "Orang Raiat," and to Europeans as Jacoons. In the hills about Slim there are said to be three thousand of these people, and there and on the Perak hills of Batang Padang, Bidor and Songkei, as many as ten thousand.

The Jacoons of Slim have a head man of their own with the title of Datoh, and the Malays are obliged to consult him and ask his advice on all important matters, otherwise, it is said, the Jacoons would at once attack the Penqhulu and his people, who dread the poisoned arrow of the "Sumpitan," or blow-pipe, more than rifle bullets.

The Jacoons are clever gardeners and cultivate sugar cane, plantains, sweet potatoes, and other vegetables in abundance. Rice they use but little.

Tobacco they are very fond of, and grow it themselves, to chew, not to smoke. Their own tobacco they use green, but they prefer Japanese if they can get it.

The solitary garment, or rather rag, used by them, is made of bark, the men wearing it in its simplicity, the women affecting an additional fringe of grass.

Like the natives of Borneo, the Jacoons cover their arms with brass wire. A girl I saw, whose toilet had apparently cost her some trouble, had her arms covered with numberless brass rings. She wore some dozen strings of coloured beads, to which were hung more brass rings, round her neck, the beads fastened behind with a buckle of shells and boar's teeth; through her nose she had a long porcupine's quill, and her face was painted in stripes of black and red, beginning at her forehead and ending, in the shape of a pitch-fork, on her mouth and chin.

Their men are above the average size of Malays, their women of the ordinary height, their hair is not straight, but long and fuzzy, and they all without distinction have their noses bored, and wear in them a bamboo, a folded plantain leaf, or a porcupine's quill, and by far the greater part of them are afflicted with a fearful skin disease.

The Jacoons can walk wonderful distances, and make their way with ease through a jungle which Malays would not dream of entering, and through the jungle they will carry as heavy weights as a Chinese coolie.

They are a wonderfully harmless and docile race, and often make themselves very useful to the Malays, who make but the poorest return to them.

The language spoken by the Jacoons is totally different to Malay,

upper teeth, and sometimes also the two lower ones in the centre.
Diagrams of feet have also been taken.

and entirely unknown to the Malays; and the further you go into the mountains the fewer Jacoons will you meet who understand any language but their own.

Notes on Pointed Forms of Pottery among Primitive Peoples.

By J. J. Atkinson.

As regards the very generally pointed forms of pottery to be found among primitive people, it is to be remarked that doubtless this form in itself is mechanically the strongest, an important detail with so fragile a material as clay, badly worked as we may expect it to be in such circumstances. It also will withstand in this form more easily the pressure of its contents, which is also important, as the pots, to avoid cracking with unequal distribution of heat, are necessarily made comparatively very thin. As the hearth among pot-using savages is simply formed of three or four stones, this pointed form has another advantage as it allows the point itself, by resting on the ashes in the middle of the fire, to relieve its fragile sides from undue pressure against the more or less irregular formed stones which form the fireplace. Being thus also embedded in the very fire, the contents are more quickly heated, and all the heat of a chimneyless, wind-swept hearth utilized. Again, the irregularity in height and shape of the hearth-stones (the more or less wandering life of savages preventing much choice or fashioning) would quite prevent any flat-bottomed pots (which are generally also very shallow) being of use from loss of contents. The sharp ended pots, on the contrary, are of very considerable length in proportion to their breadth, as four to one, which enables them to conserve their contents, although generally to be seen on the fire at a very considerable angle.

Curious to say, the method of fabrication of pottery among the New Caledonians, at least, would lead directly to and necessarily entail this pointed form. The process is (or was) as follows:—The clay is first carefully worked, some places being celebrated for the superior quality furnished: it is then formed into narrow rope or ribbon-like bands. The potter has before him, resting on the hard ground, a round but flattish water-worn stone, such as abound in the river-beds here. On this he puts a small dab of clay as a beginning: now as the quite flat portion of this shaped stone is naturally *small*, this dab of clay, which is to be the *bottom* of his pot, is also *small*. Round this dab, he winds his first rope or ribbon, on this again another, and so on, gradually enlarging the circumference, and smoothing them with his fingers and a small smooth flat stone. It is to be remarked that as the under side of the stone on which he builds

his pot is naturally like all water-worn stones, more or less rounded and convex shaped, it presents at its apex but a small surface to the hard ground on which it rests, and thus turns or pivots with ease. In fact, it is evident that it at once becomes a natural primitive potter's wheel, turning round and round as he works. Until I had found out their method, I was always puzzled to account for the very regular contour of native pottery. This building up of the pot by layers of ropes of clay, leaves at times traces of faint horizontal marks. These imitate the marks left by pottery made on the system of plastering wicker-work employed by some people. And this latter method seems to me so very clumsy a one, that I cannot help thinking that it is more local than has been supposed, and that in some cases what have been considered traces of basket-work were in reality marks of fabrication on the New Caledonian system, with the natural potter's wheel expedient. This would be more certain if the contour of the pots are exceptionally regular. This would prove the New Caledonian method more widespead than is generally supposed, although of course only where water-worn stones could be found. These would be rare for instance on the vast alluvials at mouths of large rivers, such as Amazon, &c. The geology of the country would be an all important factor in the question—thus sharp-ended pots would not be found in human centres on alluvials such as the Nile, or, if very common, would prove the inhabitants descendants of a mountain inhabiting race, especially if shallow flat pots were unknown or rare.

Manufacture of paper by the natives of Corea.[1]

THE manufacture of paper is extensively carried on in Corea, as there is a great demand for it owing to its toughness and durability, which render it useful in many ways. The windows of Corean houses consist of wooden latticed frames covered with paper sufficiently transparent to admit the light. Oil-paper, about ¼-inch in thickness, is pasted on to the floors instead of carpets or mats, white lanterns of all shapes and sizes are made out of paper, as are also tobacco pouches and fans. Oil-paper is used for making the conical rain hats which are fastened on to the ordinary black hat in wet weather, while large oil-coats or mackintoshes are made of the same material. Until recently the Coreans were not in the habit of carrying umbrellas, but of late the fashion has been introduced and the import for 1892 was over 40,000. Again, a very thick kind of paper is used for boxes and trunks which are strong enough to hold clothes and other heavy articles. Paper is the one native article manufactured in Corea which is exported in any quantities to the neighbouring country of China. It is in

[1] Extracted from the Foreign Office Report for the year 1892.

general use there for the papering of rooms and windows as in Corea.

The manufacture of a coarse kind of paper for the purposes above referred to is carried on outside the north gate of Söul, in a valley through which runs a stream; the houses and yards where the paper is made being situated close by, as the water plays an important part in the manufacture. The process is extremely simple and nothing but manual labour is employed.

Old rags and paper of all kinds are brought out from the city and first placed in a large tub at the side of the stream, where they are thoroughly washed and all the dirt and ink is beaten out of them. The clean materials are then carried to a long wooden trough where they are stamped into a pulp by men who dance on the mass with their bare feet, much in the same way as the juice is pressed out of the grape in France and Spain. The water is then allowed to run off and the white pulp is thrown into a large wooden tank full of water, slightly warmed in winter to prevent it freezing. After the pulp has soaked for an hour or so, the workmen take a bamboo mat, about 4 feet long and 3 feet broad, which they place on a wooden frame and dip into the tank, one manipulator standing on each side. The frame is almost immediately taken out again covered with a thin layer of white pulp, which is thrown neatly on to a cloth at the side. The bamboo mat is then peeled off so as to leave a smooth sheet of pulp behind. Again the frame is dipped in and another sheet is thrown on top of the first one, and so on till there is a pile several feet in height. The sheets of pulp are then laid out in bundles to dry in the sun. When sufficiently hard the sheets are cut up into small strips and placed in another wooden tub, preparatory to being worked over again. The second process is exactly the same as the first, except that the roots and seeds of a certain plant called "takpool," or starch-wood, are put into the water to make it glutinous and thus render the paper tough and durable. When the sheets are almost dry they are taken singly and spread out on a flat slab of granite, where men with large wooden mallets beat the paper to the requisite thinness. For the thicker kinds, several pieces are beaten together Again the sheets are dried in the sun, and then they are ready to be folded and taken to the paper shops. On an average about two hundred and fifty large sheets are made in a day, giving employment to ten or eleven men. The sheets are sold at about two hundred and fifty cash, or about $2\frac{3}{4}d.$ per piece, but the price varies, of course, with the quality. The finer kinds of paper are not manufactured at Söul, but at different places in the southern provinces. They are made by simply soaking the "takpool" plant in water and extracting the starch. The layers of fine pulp are then worked as before described.

"A Manipuri Grammar, vocabulary, and phrase book," to which are added some Manipuri proverbs and specimens of Mani-

puri correspondence. By A. J. Primrose. (Shillong, 1888.) pp. 100.

"**Outline Grammar of the Shaiyâng Miri language,**" as spoken by the Miris of that clan residing in the neighbourhood of Sadiya. With illustrative sentences, phrase book, and vocabulary. By J. F. Needham. (Shillong, 1886.) pp. 157.

"**A curious Aino toy.**" By E. S. Morse. (Bulletin of the Essex Institute, vol. xxv. pp. 1–7. Salem, Mass., U.S.A.) The toy consists of a bird on wheels, the origin of which the author traces to Egypt. (Illustrated.)

"**Evolution and Ethics.**" The Romanes Lecture, 1893. By T. H. Huxley, F.R.S. (Macmillan, 1893.) 8vo. pp. 57.

"**Evolution in the Ornamental Art of Savage Peoples.**" Ethnographical researches by Dr. Hjalmar Stolpe (Stockholm). Translated by Mrs. H. C. March. pp. 80. (Trans. Rochdale Lit. and Sci. Soc.) This important treatise, which appears to have been admirably translated, should be studied in conjunction with that by Mr. C. H. Read, published in the Journal of the Institute, November, 1891. (Fully illustrated.)

"**Customary Law of the Gujrat District.**" Vol. ix. By Capt. H. Davies, B.S.C. (Lahore, 1892.) pp. 13 and vi.

"**New Zealand Census, 1891.**" (Wellington, N.Z., 1893.) A census of the Maori population is also given.

"**On the connection between stone circles and adjacent Hills.**" By A. L. Lewis. (Trans. Shropshire Arch. and Nat. Hist. Soc.)

"**The Feeble-Minded Child and Adult.**" Charity Organisation Series. (Swan Sonnenschein, 1893.) 8vo. pp. 152. A report on an investigation of the Physical and Mental condition of fifty thousand school children, with suggestions for the better education and care of the Feeble-minded Children and Adults.

"**Character in the Face.**" Our looks and what they mean. (Chapman and Hall, 1893.) 8vo. pp. 256. A list is given of the authors whose works are cited, and the importance of the various features is discussed at considerable length.

"**Theosophy; or, Psychological Religion.**" The Gifford Lectures, 1892. By F. Max Müller. (Longmans, 1893.) 8vo. pp. 585. The titles of the lectures are: The Historical study of religion, The true value of the Sacred Books examined, The historical relationship of ancient Religions and Philosophies, The relation of Psychological to Physical and Anthropological religion, Journey of the Soul after death, The Eschatology of the Avesta, Eschatology of Plato, True Immortality, The Vedânta-philosophy,

The two schools of the Vedânta, Sufiism, The Logos, Alexandrian Christianity, Dionysius the Areopagite, Christian Theosophy.

"Comparative Philology" of the Old and New Worlds in relation to Archaic speech. By R. P. Greg. (Kegan Paul, 1893.) 4to. pp. 355. "In compiling the present work on Comparative Philology, the leading idea was to present in a fuller and more compact form than hitherto given, comparisons for certain classes of simple words (or ideas) as between the languages of the Old and New Worlds; and although I have considerably extended the scope of my original intention, the general results tend, I think, to show that verbal and root analogies may prove to be more interesting and numerous than has generally been supposed; favouring the idea of original unity for language if not for race; as regards unity of language, however, not in its narrower or more commonly accepted sense, but as having primarily possessed great and wide-spread archaic simplicity, and rich at the same time in both *homonymous* and *synonymous* forms." The work contains a large number of vocabularies.

"The Chinese Classics," with a translation, critical and exegetical notes, prologomena, and copious indexes. By James Legge. (At the Clarendon Press, 1893.) 8vo. pp. 503. Second edition, vol. i. The contents of the first volume are as follows; Books included under the name of the Chinese Classics, The authority of the Chinese Classics, Formation of the Text of the Analects by the Scholars of the Han dynasty, At what time and by whom the Analects were written, their plan and authenticity, Of commentaries upon the Analects, Of various readings. History of the text of the Great Learning and the different arrangements of it which have been proposed. Of the authorship and distinction of the Text into Classical Text and Commentary, Its scope and value. The place of the doctrine of the Mean in the Lî Chî and its publication separately. Its author and some account of him. Its integrity. Its scope and value. Life of Confucius, his influence and opinions, his immediate disciples. The body of the volume contains 20 books of Confucian Analects, The Great Learning, and the Doctrine of the Mean.

"Five years with the Congo Cannibals." By Herbert Ward. (Chatto and Windus, 1891.) 8vo. pp. 308. This work gives a vivid description of life on the Congo, and is well illustrated.

"Discovery of the Exact Site of Asokas Classic Capital of Pātaliputra," the Palibothra of the Greeks, and description of the superficial remains. By L. A. Waddell, M.B. (Calcutta, at the Bengal Secretariat Press, 1892.) pp. 29. Illustrated.

"Where Three Empires Meet." A narrative of recent travel in Kashmir, Western Thibet, Gilgit, and the adjoining countries. By E. F. Knight. (Longmans, 1893.) 8vo. pp. 495. Map and 54 illustrations. The full page plates give an excellent idea of

the Mystery play, Himis. Mask of the Delai Lama descending the temple steps. The Devil dance, &c. And the volume describes clearly the route traversed by the author. The description of the Mystery play is of special interest.

"**The Nāladiyār,**" or four hundred quatrains in Tamil, with introduction, translation, and notes critical, philological and explanatory, to which is added a Concordance and Lexicon, with authorities from the oldest Tamil writers. By G. U. Pope, D.D. (At the Clarendon Press, 1893.) 8vo. pp. 440. "This edition of a popular Tamil Classic was undertaken with the view of assisting Europeans to acquire some acquaintance with classical Tamil. It is intended to be taken up after the study of the second Catechism of Tamil Grammar, to which references are given throughout, and is a companion volume to the Kurraḷ; these two great works serving as mutual commentaries, and together throwing a flood of light upon the whole ethical and social philosophy of the Tamil people."

"**Ancient India.**" 2000 B.C. to 800 A.D. By Romesh C. Dutt, C.I.E. (Longmans, 1893.) pp. 196. The volume is the first of a series of Manuals termed Epochs of Indian History. Important information is given on the religions, manners, and customs, science, &c., of the periods dealt with.

"**Hebrew Idolatry and Superstition,**" its place in folk-lore. By Elford Higgens. (Elliot Stock, 1893.) pp. 80. The sections into which the book is divided are: Traditional Religion; The Religion of the Soil; Amorite Religion and the Worship of Heavenly Bodies; Divination; Witchcraft; Enchantment.

"**Life with Trans-Siberian Savages.**" By B. Douglas Howard, M.A. (Longmans, 1893.) pp. 209. The book gives an interesting popular account of the Sakhalin Ainus.

"**Diary of a Journey across Thibet.**" By Capt. H. Bower, 17th B.C. pp. 116. This very important publication opens up a district previously quite unknown. The illustrations of masked Monks, &c., are of the utmost interest, and the issue of the work to the public indicates a most satisfactory change of policy on the part of the India Office.

"**Vocabulary of the Kwakiutl Language.**" By Franz Boas. (Amer. Phil. Soc., Nov. 18, 1892.)

"**Bibliography of the Athapascan Languages.**" By J. C. Pilling. (Smithsonian Inst., Bureau of Ethnology, 1892.)

"**On Trepanning the Human Skull in Prehistoric Times.**" By R. Munro, M.D. Illustrated. (Proc. Soc. Antiq. Scot., vol xxvi.)

"**Further Notes on Fuegian Languages.**" By D. G. Brinton, M.D. (Amer. Phil. Soc., May 6, 1892.)

"Further Notes on the Betoya Dialects"; from unpublished sources. By D. G. Brinton. (Amer. Phil. Soc., Oct. 7, 1892.)

"The Evolution of Decorative Art." An essay upon its origin and development as illustrated by the art of modern races of Mankind. By Henry Balfour, M.A. (Percival, 1893.) pp. 131. The author deals with the subject under the following main headings. The appreciation and adaptation of natural or accidental peculiarities as ornamental effects. The reproduction artificially of natural effects; copying, successive copying. Variation. Human designs on spears and pottery vessels from various countries. The survival of the principal feature in a symbolic design. Influence of one design over another. Influence of animistic doctrines. Retention of once useful objects as ornament after their use has ceased. Several most instructive plates are given to illustrate the honest attempts of indifferent artists to reproduce a given sketch, each in turn working from the sketch of the former.

"Transactions of the Asiatic Society of Japan." Vol. xx. Part 2. "A description of my hut" (a priest's hut), by J. M. Dixon. Specimens of Ainu folk-lore, by J. Batchelor. Feudal land tenure in Tosa, by R. B. Grinnan.

"Smithsonian Report." Report of the U.S. National Museum, 1891. The methods of fire making, by W. Hough, illustrated. The Ulu or woman's knife of the Eskimo, by Otis T. Mason, illustrated. The ancient pit dwellers of Yezo, by R. Hitchcock, illustrated. The Ainos of Yezo, by R. Hitchcock, illustrated. The Catlin collection of Indian paintings, by Washington Matthews, illustrated. Anthropology at the Paris Exhibition, 1889, illustrated.

"Journal of the Ceylon branch of the Royal Asiatic Society." Vol. xii, No. 43. Sinhalese weights and measures, by F. Modder. The Ethnology of Ceylon, by Louis Nell.

"The American Antiquarian." Vol. xv, No. 3. Man and language, by Horatio Hale. Black-foot star myths—the Pleiades, by M. N. Wilson. Prehistoric ruins in New Mexico, by Mrs. E. Jones. Pre-Columbian copper mining in North America, by R. L. Packard. Intaglio effigies of Wisconsin, by T. H. Lewis. Cliff dwellers houses by Palmer Henderson. Folk-lore of Hawaii. A buried race in Chili, by H. I. Smith.

"l'Anthropologie." Vol. iv. No. 1. The Natives of the Saloman Islands, by Dr. Hagen. Certain facts relating to the history of circumcision among the Syrians, by T. Reinach. Report of the XIth International Prehistoric Archæological and Anthropological Congress at Moscow. Religious ideas of the Battaks-Karo, by M. d'Estrey. Primitive monuments in the Balearic Islands, by E. Cartailhac. Illustrated.

The Editor of the Journal is prepared to circulate with each number inquiries from Fellows on Subjects of Anthropological interest. Replies will be printed, or MSS. forwarded at the Editor's discretion.

THE JOURNAL

OF THE

ANTHROPOLOGICAL INSTITUTE

OF

GREAT BRITAIN AND IRELAND.

APRIL 11TH, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The presents that had been received were announced, and thanks voted to the respective donors.

Mr. G. M. ATKINSON read a paper by Mr. H. MICHELL WHITLEY and Dr. TALFOURD JONES on a "Cranium from a Grave at Birling, near Eastbourne, Sussex."

Mr. WHITLEY, Dr. GARSON, Mr. STOPES, and Professor MACALISTER joined in the discussion.

Professor MACALISTER read a paper entitled "Stray Notes on Egyptian Mummies."

Sir W. H. FLOWER, Dr. GARSON, and Mr. STOPES took part in the discussion.

Mr. W. H. L. DUCKWORTH read a paper on "Two Skulls from Nagyr."

Sir W. H. FLOWER and Dr. GARSON joined in the discussion.

A paper on "Damma Island and its Natives" by P. W. BASSETT-SMITH, R.N., was read.

UOFM

NOTE *on a* CRANIUM *from a* GRAVE *at* BIRLING, *near* EASTBOURNE, SUSSEX. By H. MICHELL WHITLEY, F.G.S., AND TALFOURD JONES, M.D. *Communicated through* G. M. ATKINSON, Esq., who exhibited the skull.

ABOUT five years ago in extending a chalk pit at Birling, about three miles westward of Eastbourne, several skeletons were found.

The discovery is fully described in the "Collections of the Sussex Archæological Society," vol. xxxvii., p. 113.

During a visit which he paid to Eastbourne, Mr. George M. Atkinson urged the desirability of obtaining measurements of one of the skulls.

An opportunity having presented itself of doing this, the following notes are the result:—

The skeleton to which the cranium belonged was well preserved and was buried at a depth of 4 feet, the head being S.E. and the feet N.W.

The height was about 5 feet 9 inches, it lay on its back, the head inclining on the right shoulder, the right arm drawn up and resting across the breast, the left extended by the side.

Three long iron nails, and about two dozen small iron sandal nails were found at the feet.

Nothing else was in this grave, but in the others bronze armlets, a plain flat bronze ring, and fragments of an urn were exhumed.

We carefully measured the skull, which had been removed for that purpose, with the following results.

Cephalic Index. The long diameter from the glabella, or centre of supra-orbital line, to the most distant part of the occiput was 7·2 inches, or 186 mm.

The short diameter, or greatest breadth in the parietal regions was 5·2 inches, or 134 mm.

This gives a proportion of 100 to 72, and the cranium would therefore be classed as Dolichocephalic.

Altitudinal Index. The distance from the basion to the junction of the coronal and sagittal sutures was 5·1 inches, which gives a proportion of 100 to 71.

Gnathic Index. The distance from the basion to the alveolar point was 3·8 inches, which gives a proportion of 96 in 100, classing the skull as orthognathous.

Nasal Index. The height of the nasal aperture from the nasion to the lower border of the base of the nasal spine was 2 inches and the width of the nasal aperture 1·05 inches, giving

a proportion of 100 to 53; the nose therefore belongs to the Platyrhine type.

Orbital Index. The horizontal diameter of the orbits was 1·63 inches and the vertical 1·50 inches, giving a proportion of 100 to 94, thus classing the cranium as Megaseme.

The distance across the orbits from one fronto-malar suture to the other, was 4·25 inches.

The extreme width of the zygomatic arches measured from one zygomatic suture to the opposite one, 4·9 inches.

The distance from the meatus auditorius was :—

I.	To centre of supra-orbital line ..	5·50 inches.
II.	To centre of frontal suture over the frontal eminence.. ..	6·00 „
III.	To centre of sagittal suture over the parietal eminence ..	6·50 „
IV.	To centre of occipital protuberance	6·65 „

A line drawn from the condyle of the occiput along the floor of the nostril and intersected by another line touching the most prominent parts of the forehead and upper jaw gave an angle of 85°.

The teeth remaining are sound but much worn down, the enamel good and sound and no apparent decay; in the upper jaw two teeth are missing, the sockets presenting a smooth and uniform appearance.

From the relics found with the skeletons their date must be assigned to the Romano-British Period.

Mr. H. Michell Whitley attended the meeting and exhibited the bronze rings and armlets. In supplementing his paper he remarked that—

The graves which had been described, and from one of which the crania was taken, belonged undoubtedly in his opinion to the Romano-British Period.

In this grave the long characteristic coffin nails were unearthed, and at the feet of the skeleton several little shoe nails, used in the sole of the Calceus, lay.

In another grave, that of a female, three bronze bracelets and a bronze ring were found; these had been submitted to Mr. A. W. Franks, and pronounced by him of Roman date, one having, however, a very peculiar ornamentation of almost Saxon type.

In another grave a little vase of pottery of the same period was found.

The valley at Eastdean has a bed of clay in its hollow, and in

this bed, rude pottery, shells, and chipped and polished flint implements have been found, between Eastdean Church and the road from Eastbourne to Newhaven.

The whole district abounds in traces of its early inhabitants, and the spurs of the hills at Eastbourne are especially rich in these remains. At Greenstreet he had uncovered a pit dwelling rudely walled around, with a hearth-stone in the centre, and several rubbish pits on the slopes of the hill opposite.

Discussion.

Professor Macalister fully concurred in the assignment of the metal ornaments to the late Roman or immediately post-Roman age. Skulls of the peculiarly coffin-like shape, wide at the parietal eminences and tapering backwards to a capsular occiput, tapering more slowly forward to a narrow frontal region, were with some reason assigned by the late Professor Rolleston to the early Saxon period; with this view his own observations agreed. In a large Saxon cemetery examined by him in Cambridge lately all the skulls were more or less of this shape, and the same type prevails in the large collection of skulls found with Saxon knives and clasps and coins at Hauxton, Cambs.

Mr. Stopes directed attention to the extreme richness of this particular neighbourhood in relics of Palæolithic and Neolithic man, and the great amount of evidence of the numberless encounters that had through so many succeeding ages taken place on this natural front line of defence of our country.

More particularly he wished to direct the attention of members of the Institute to the great credit due to Mr. Hilton, of Eastdean, for the services rendered during the many years of unwearied and patient toil he had devoted to finding evidences of primitive man. His collection was a large one, and it was of the greatest benefit to our science to have in such spots men who quietly and steadily accumulate grand collections that are of so much interest in the present and are of still greater worth in preserving from destruction for future use, so many objects, the full value of which we do not yet know. A few years ago, he (the speaker) had ventured to direct attention to what seemed a rather wild hypothesis as to evidences of retrogression in pre-historic periods. The wonderful collection of Mr. Hilton had tended to confirm the opinion that there were times when men became possessed of highly polished Neolithic tools which they deliberately chipped back to ruder and possibly more convenient form, that they could more effectually handle. Many hundreds of tools of this type have been found in the neighbourhood of Eastdean, showing that the same story has been told there as in the Upper Thames valley, which is so exceedingly rich in tools of the same class. The Society was doing work

of the very greatest utility in encouraging all such workers to accumulate facts and to preserve such objects, as without their patient toil would probably be lost entirely to science.

Dr. GARSON remarked that he had had the opportunity of examining the cranium exhibited, and confirmed the various measurements of it which had been made by the author of the paper. From its low cephalic index it might be supposed that it belonged to the same race as the people whose remains are found in Long Barrows. It, however, possesses other characters which indicate that this is not the case, but that it belonged to a subsequent race which inhabited the country in what is termed the Romano-British times. This is in accordance with the archæological relics found with it. In future explorations in the same district it is very desirable that other parts of the skeleton should be preserved, especially the pelvis and limb bones, which are very important. The hob-nails which were found at the feet of this subject are exactly similar to some found with a skeleton at Woodcuts, by General Pitt-Rivers.

NOTES *on* EGYPTIAN MUMMIES. By A. MACALISTER, LL.D., D.Sc., M.D., F.R.S., President.

THE Cambridge Anatomical Museum contains a large series of Egyptian mummy heads, nearly five hundred of which have been obtained within the last few years through the kind assistance of Dr. Budge. These I have unwrapped with great care, and as I have also had the opportunity of unrolling five whole mummies, I have, whilst thus engaged, made notes on some points which supplement the accounts given by those authors who have written on the subject.

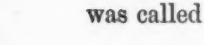
The literature of embalming is not very extensive; and most of the earlier references are abstracted in Pettigrew's work published in 1834.[1] The information in reference to the earlier stages of the operation obtained from Egyptian sources is scanty, the well-known and oft-quoted passage in Herodotus (ii, 86–88) still constitutes the chief fountain of the literary history of these early parts of the process. In regard to the later and more purely symbolical stages, our knowledge is much greater. Papyrus No. 3 of the Gizeh Museum[2] gives an elaborate description of this portion of the office, and papyrus 5158 of the Louvre, although it is, unfortunately, in a fragmentary condition, supplements this in several details. The several funeral

[1] "History of Egyptian Mummies," London, 1834.
[2] Maspero, "Mémoire sur quelques papyrus du Louvre," 1875, pp. 14–104.

rituals[1] which exist in several papyri, and in some tomb inscriptions, give additional information with reference to these later performances. There are, in addition to these, many references to parts of the ritual in monumental inscriptions.

In the present paper I intend only to treat of some points regarding the materials and methods used in embalming, which I have noted in the course of my unwrappings. I reserve my notes on the physical Anthropology of the Ancient Egyptians until I have completed my measurements and comparisons.

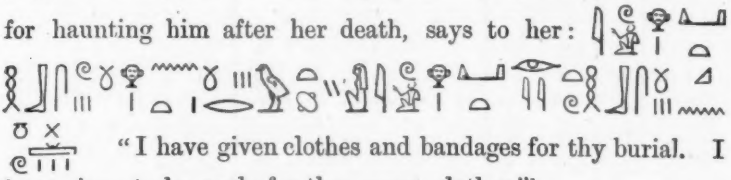
The mummies on which my observations have been made, according to the information obtained from the respective donors, are of different dates, but are chiefly of persons who lived in the times of the twelfth, nineteenth, and twenty-second dynasties, dating approximately from the twentieth to the eighth centuries before the Christian era. One belonged to the twenty-sixth dynasty, and two were of Ptolemaic age. They were mostly middle class folk, the class whom the explorer on the spot, to whom the wealth of more interesting remains is accessible, would naturally pass by without notice, but who are of interest to the anthropologist, as, in general, among all nations these are of less mixed blood than the classes of a higher or of a lower social grade. They were of all ages from twenty months up to edentulous old age, and consisted of individuals of both sexes.

The materials on which I have to remark are the linen of the bandages and the preserving materials; each has given a name to the mummy in the ancient language of Egypt. The body was called  *kesâu* "the wrapped up one," from its form and bandaged condition. It was also named *âb* "the pure one," from the belief that the spiritual parts were purified after death in the lower world just as the physical frame was preserved by the process of embalming.

As Pettigrew and others have noticed, the quantity of linen used in clothing the mummy was enormous. The bandages of one which I unrolled in Cambridge must have been nearly a kilometre in length, while those of another were over twelve kilogrammes in weight. In one neck I counted fifty-three layers of bandage superposed, and over one face thirty-five layers crossed at one spot.[2] The quantity used seems to have been in

[1] Schiaparelli, "Il Libro dei Funerali," 1882–1890. 3 vols.

[2] Greaves in his "Pyramidographia," 1646, writes, "there could not be lesse than a thousand els upon one body." See also "The Linen Trade," by A. J. Warden, 1864, p. 155. This work contains much curious information on the linen fabrics of antiquity.

some sort a measure of the affection of the relatives. In a papyrus in Leyden, a sorrowing husband, reproaching his wife for haunting him after her death, says to her:  "I have given clothes and bandages for thy burial. I have given to be made for thee many clothes."[1]

I have microscopically examined very many pieces of this cloth from mummies of different periods, and I have found that in all cases it is pure linen. This point, indeed, has been set at rest by the microscopical researches of Bauer, as recorded by Thomson and Yates.[2] The last-named author has dealt exhaustively with the subject from the standpoint of classical literature, and has proved that the *σινδὼν βυσσίνη* of Herodotus, which was supposed, erroneously, by Rouelle and many others to be cotton,[3] can be no other material than flaxen cloth. Not a trace of cotton fabric was found in any of the specimens which have come under my notice.

The texture of the linen which enwrapped these mummies is variable in strength and fineness, and justifies the somewhat extensive nomenclature of the different forms of the fabric which are so puzzling to the students of Egyptian texts. M. Rohault de Fleury[4] published some years since a letter to M. Devéria, in which he tabulates the numerical constants of the linen taken from mummies in the Louvre, in terms of the weight of the square metre in grammes, the number of threads in the warp, and the number in the woof in each centimetre of length or breadth. I have made many similar observations, and have combined his results with mine in the following table, indicating my additions to the series by the letter M, those of his table being marked by F. In fabrics prepared by hand-spinning and hand-loom weaving one naturally expects a greater variety in the results than in the more uniform products of steam-power machinery; so it is probable that we have not exhausted in this table the varieties existing both in regard to the size of the yarn, and the closeness of texture:—

[1] Papyrus, i, 371. Transcribed in Maspero, "Études Égyptiennes," p. 155, and in "Quelques Peintures," p. 155.

[2] "Philosophical Magazine," 3rd Series, v. 1834, p. 355. Sir G. Wilkinson quotes this author as "Thompson," but does not give the reference. Yates, "Textrinum Antiquorum," i, 254.

[3] "Mémoires de l'Académie Royale des Sciences," 1750, p. 123.

[4] "Les Étoffes Égyptiennes," "Revue Archéologique," N.S. 1870, p. 217.

No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
1	66	32	122	M.	8	32	17	109	F.	15	28	14	236	F.
2	62	32	42	F.	9	32	16	88	F.M.	16	28	12	390	F.
3	52	31	55	F.	10	30	20	76	F.M.	17	28	11	250	M.
4	46	20	88	F.	11	30	15	90	M.	18	28	10	..	M.
5	40	20	88	M.	12	30	14	153	F.M.	19	26	16	214	M.
6	40	17	200	F.M.	13	30	8	100	M.	20	24	22	..	M.
7	36	14	262	F.M.	14	28	16	171	F.	21	24	18	100	F.

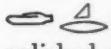
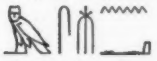
No.	Warp.	Woof.	Weight.		No.	Warp.	Woof.	Weight.	
22	24	16	420	F.	29	20	10	166	F.
23	24	16	450	M.	30	20	9	343	F.
24	24	14	250	M.	31	16	8	375	F.
25	24	12	237	F.	32	14	14	276	M.
26	24	10	172	F.M.					
27	22	12	172	M.					
28	20	12	230	F.					

Almost all the specimens show that, as Thomson has described, the threads in the warp are always more numerous than those in the woof. At the same time M. Fleury puts it too strongly when he says "la chaîne a presque toujours deux fois plus de fils que la trame."

There is a great range of variety in the fineness of the yarn, and in the degree of closeness of the twist in its spinning. In the finer textures it is very firmly and closely twisted, there being five to seven twists in each mm., and the diameter of the yarn is from 0·12 to 0·2 mm. From this they range upwards to coarse threads of 1 mm. and even greater thickness, and with scarcely six twists in the cm. The woof yarn is much coarser than that employed for the warp; thus in the more common varieties like Nos. 20 to 26, it is about 0·35 mm. while that of the warp is about 0·26. In Ure's "Dictionary of Manufactures"[1] it is stated that the Egyptian spinner rarely made yarn finer than 50 leas, whereas the modern yarns are spun to 300 or even to 1,200 leas; but in the fabric No. 1 in our table the warp-yarn must have been spun to 325 leas and the woof-yarn to 160 leas.

[1] 6th edition, vol. ii, p. 337. Yarn is "counted" by the number of leas, each 300 yards in length which can be spun from 1 lb. avoirdupois of flax. In Marshall's tables ("The Practical Flax-Spinner," 1885, pp. 40 and 220) 350 leas is the finest texture given.

I have submitted a number of samples of these linens to my friend Mr. Hugh Porter, who is well acquainted with the different textures of Belfast linens, and he tells me that the linen which is most commonly used in the wrappings is extremely like that known in the trade as 11^{00} linen, only that in the modern textures there is approximately the same number of threads in the cm. of warp and woof.

The varieties in the texture of the yarn are intelligible, when we observe the process of manufacture as shown on the monuments. In the tomb paintings at Beni-hasan as copied by Lepsius (Denkmäler, II., 126), we have depicted the successive stages of this industry; the "retting" of the flax, and the beating out of the fibres with wooden beetles. The twisting of these into the yarn is accomplished with a spindle called *ḫesef*, seldom if ever with a distaff. There are in the several museums various patterns of these wooden spindles for different kinds of yarn.[1] In one of the pictures, the operation of spinning is named *set*, and the spinner holds the end of the yarn in his hand. In another picture it is over his shoulder; in another the end is fastened to a forked upright staff (Rossellini, xli, 4), and the spindle is in the hand of the workman. In another the making of the very fine yarn is shown. It is being twisted on a flat stone, and after this it is rolled between the hands of workwomen, who are represented kneeling and rubbing the threads smooth on the stone. It is to this process, which is named  *ṭeker* (Champollion II., 342 and 362), that the highly polished, smooth and finely twisted warp threads of the stuffs Nos. 1, 2, and 3, in the table owe their closeness and lustre. The name  *mesenā* is applied to this process in the plate given by Lepsius. After spinning, the yarn is gathered into hanks for the weaver.

The process of weaving, which was named *sekhet*, is also represented on the monuments, and is referred to by Herodotus (ii, 35). I have not data sufficient to determine what was the breadth of the web of cloth in my specimens, as I have found few satisfactory pieces with a selvage on each side. The web must have been of considerable length, as some of my bandages measure over ten metres in length and have been cut off at one end. Mr. Griffith in his notes on the story of the

[1] Spindles of the twelfth dynasty are figured by Petrie "Kahun," Pl. IX, Fig. 26, and p. 27.

Sekhti translates one passage "the width of a piece of cloth," and suggests the probable explanation that the Egyptian looms usually produced cloth of a fixed width.[1]

The textures marked 31 and 32 are remarkable, as in them each two contiguous threads of the warp are treated as one in shedding; that is, they are simultaneously raised and depressed to allow of the passage of the shuttle, which also carried two parallel threads of the weft simultaneously. The result is a pretty double-threaded texture resembling in pattern that represented by Ashenhurst in his figure 155B.[2] The linen fabric in the market at present, which resembles this most closely, is one called Java canvas, but this is slightly more complex, as it is diapered. There is a cotton cloth in the shops exactly like it, used for tennis shirting now-a-days. The fabric No. 32 is the only Egyptian cloth in my collection in which the numbers of threads in the warp and woof are equal. In one specimen the warp thread is double, each pair being twisted, while the woof thread is single. In another there are parallel pairs of warp threads as in No. 32, but only a single woof thread, making a pattern like Ashenhurst's Fig. 58 (p. 170).[3]

In all my pieces the end of the web is strengthened by strong woof filletings, each of four or five threads of yarn carried simultaneously, either parallel or twisted together in a bundle, by the shuttle, and returning either immediately at the next shedding or after two or more wefts of single threads of ordinary size. There are many varieties of this filleting which resembles that now in use in towels or coarse pocket-handkerchiefs. In some the woof threads between these double fillets of the border are of blue yarn[4], making a blue stripe one cm. or more in width resembling the edge of a modern gingham. I have no examples of true diapering or twilling or of fancy weaving such as may be seen represented on some of the monuments, or such as M. Fleury has figured from specimens in the Turin Museum (*loc. cit.*)

There is often a stronger thread laid at regular intervals in the warp, and in like manner a proportionally thicker thread

[1] "Proc. Soc. Bib. Archæology," xiv, p. 466.

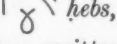
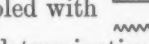
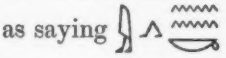
[2] Ashenhurst, "Weaving and Designing of Textile Fabrics," Huddersfield, 1887, p. 199.

[3] The weights of the metre-lengths of the cloth are only approximate, as it is not easy to free the cloth of adhering foreign matter, and few pieces have a selvage along both sides. Of No. 6 in the Table, some pieces had 14, some 17, and some 20 woof threads. Its weight also varies from 200 to 220 grammes. One specimen of Fleury's 24 by 14 (No. 24) weighed 387 grammes.

[4] The blue pigment was produced by the use of a plant called *terneken* (Dümichen, Dendera, 19, 10), probably indigo, as Thomson showed; the red is a vegetable dye, but I do not know its nature. Thomson believed it to be safflower. In one text the dye-stuff is called "the plant *nesti*."

used at about the same intervals in the woof, giving a somewhat chequered appearance to the stuff. This is so regular that it must have been done by design, not by accident.

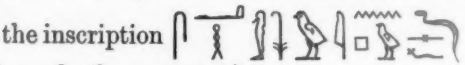
The end may be left plain as an irregular ragged fringe when it is cut off from the beam, but sometimes it is carefully finished off as a regular fringe whose tags are from 5 to 12 cm. long. Each of these consists usually of four warp threads. Each pair of these threads is twisted into a cord, and the two contiguous cords are then twisted into one tag. These threads are knotted a little beyond the middle to prevent their unravelling, and from this to the free end they are loosely twisted so that the end appears loose and soft. The texture is wonderfully regular considering that the weaver used one or two sticks to answer the purposes of the healds, treadles, and battens of an ordinary hand-loom.[1] Indeed, it is amazing how with such simple appliances as those pictured on the monuments, fine cloths like No. 1 were woven. This very fine cloth was known even in the earliest times, for there are fabrics nearly as delicate in the Berlin Museum taken from the mummy clothing of Pepi, who died about B.C. 3200. My finest samples came from a twelfth dynasty mummy dating from about B.C. 2200.

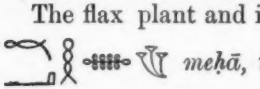
The generic name for the clothing either of the living or dead was  *ḥebs*, often coupled with  *menkh*, which is often written by its determinatives alone. These words occur in texts of many kinds, especially in the funeral formula of the common proscynemata in which the gods, especially Anubis, are invoked to grant clothing to the deceased. It must be remembered that the process of embalming was a divine work throughout, and that the earthly embalmer was the representative of Anubis, who is pictured on almost every mummy case of the better class as performing with his own hands the operations of the preservation and enwrapping of the body, and who takes the credit and responsibility of the task. This is often expressed in the inscriptions on the cartonnage or coffin. For example, on the coffin of Hatbastru in the Leipzig Museum, Anubis is represented as saying 

[1] It is probable that a comb-like slay was used to drive home the weft after each passage of the shuttle, like that mentioned by Ovid (Met. vi, 58),

"Percusso feriunt insecti pectine dentes."

There are three comb-like implements of this nature from tombs at Akhmîm and Thebes in the British Museum. (Nos. 18, 182; 20, 747; 20, 748.) Many similar combs with long handles have been found in the Scottish brochs (Anderson, "Scotland in Pagan Times, The Iron Age," p. 213), showing how widely spread this method of striking home the weft was among very diverse races.

"I come to thee and protect thee, I make perfect thy flesh, I dispose thy limbs in order, I articulate thy bones, I fill thy vessels, I stretch thy muscles." Similarly a stele in Vienna (No. 55) has the inscription  "Anubis himself hath made the mummy."

The flax plant and its derivative, linen, is named in the texts  *meḥā*, the word being sometimes used in the plural as in Papyrus Anastasi, iv, 8–11. This word is the parent of the Coptic name ⲙⲁϩⲓ.[1] The ancient linologists distinguished the flax plants of Upper Egypt from those of Lower Egypt, and Pliny[2] informs us that there were four different kinds of linen made in Egypt, named from the provinces in which they were manufactured, Tanitic, Pelusiac, and Butine from Lower Egypt, and Tentyritic from Upper Egypt. This distinction is confirmed by native records, for we find in Sallier Papyrus II, 13–7, that Lower Egypt is called the land of Meḥā, and the Thebaid is the land of Kema.[3] In the papyrus 3 from Gizeh published by Mariette[4] it is said that Harse-isis, son of Osiris, brings to the dead a portion of bandage of *Henes*, of the royal house, probably material from this last-named district.

The monuments refer to a fine linen called royal linen *suten šes*, and of this material the Great Harris Papyrus tells us garments, tunics, coverlets, caps, sheets of Horus, ear-flaps and coverings for the god Amen were made.[5] It was of this royal linen that the bandages of Sauf were made, as we learn from the Rhind Papyrus,[6] and it was expensive material, for in the same document it is called costly stuff.[7] It was probably of the same nature as the cloth known as *sesef*, which, according to a text quoted by Brugsch, seems to have been red.

This royal linen is contrasted, in the Harris Papyrus, with a

[1] Goodwin, in "Zeitschr. f. Ægypt.," 1867, p. 54.
[2] "Hist. Nat.," xix, p. 1.
[3] Brugsch, "Dict. Géog.," 1202.
[4] "Pap. de Boulaq," p. v, 21.
[5] Pl. XIV*a*–X–XVII. This material is sometimes called simply *suten*, see Maspero, "Du genre épist.," 14.
[6] Pl. VI, 2, and XXVII, 9.
[7] Pl. VI, 6.

second kind, the *kemā nefer*, "good southern linen," *i.e.*, linen of Upper Egypt, Pliny's Tentyritic linen. This was also used for tunics, earflaps and other clothes as detailed in the list of presents of Rameses III. to the house of Amen Rā.[1]

There is a third variety of linen mentioned in the same document as *māku* linen. Birch[2] translated this "mixed linen," but it seems rather to mean domestic linen, linen for household use. Fewer articles of this fabric were presented by Rameses than of the other materials, as though it were less suitable for the purposes of offerings. The word seems connected with a root which means "to cover," and Brugsch suggests that it may have been a coarse fabric, but his reasons are not convincing.

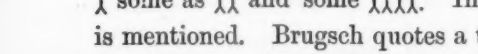
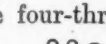
The Rosetta stone uses another word for fine linen *peku* linen. This is probably the same as the *suten ses*, and it is rendered in the Greek version as equivalent to *ὀθόνιον βύσσινον*. The context tells us that this was made in the temples for the royal palace, and hence the distinctive name "royal." Of the tribute of this article Ptolemy Epiphanes remitted a part.[3] This same material, royal linen, is mentioned in the funeral papyrus of Gizeh, in the text, "Thou hast received the bandage sacred to Pâ Râ and the piece of stuff woven in the temples."[4]

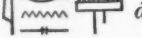
Linen was also made in other towns. That of Saïs was ordered for the bandages of the fingers; and in the funeral papyrus one cloth is described as "marvellous" from Pa Harmerui.

The different parts of the web had doubtless received different names from the Egyptian weavers. Mr. Griffith conjectures that the two words *sṭb* and *npnpt* used to describe the edges of the cloth by which the covetous steward blocked up the way of the ass of the Sekhti, may mean the "cloth edge," and the "fringe," respectively.[5] These words may fulfil the condition of the story, as we are told the cloth was square, otherwise as the fringe is formed of the warp it is at the long end of the cloth, and not at the side. Brugsch considers that *tes* means "selvage," and De Rougé conjectured that *sa*, meant the fringe of a garment. This word, however, is also

[1] Pl. XIV–VI–XII. This is probably the same as the *nefer res* of the Medum inscription given by Prof. Petrie (Pl. XX.).
[2] "Records of the Past," vi, p. 40.
[3] *Ibid.*, iv, p. 73.
[4] "Pap. de Boulaq," 3, v, 5.
[5] *Loc. cit.*, p. 467.

used as the name of a bandage. The priest in one portion of the funeral ritual is said to apply the *sau* bandage.[1]

In several inventories there are at least three of these kinds of linens mentioned, and these are again classified numerically. Brugsch conjectures that this sub-division may depend on the number of threads in the yarn. Of the some is marked as some as and some . In one place a fourfold *šes* is mentioned. Brugsch quotes a text in which one is said to be  . This he translates "clad in eight-thread garments and girdled with four-thread material."[2] The four-thread material is called  , the eight is called , the nine , or *psiṭ;* the hundred stuff is called = *šā*.[3]

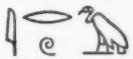
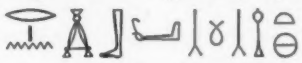
Whatever the nature of this classification may be, it cannot refer to the absolute numbers of threads, for of *kemā nefer* one inventory gives a number of categories two, three, four and a hundred. It was more probably some method of distinguishing them according to fineness. Of another linen which is named *sun*, there are one, two, three, five, six, seven, eight, nine, and one hundred given as its varieties. Textures like those very fine stuffs which head my table of fineness may be, as Brugsch suggests, the  *ȧns* mentioned in the Esneh Calendar, and probably are the same as the transparent fabric depicted on some monuments as an article of clothing; but *ȧns* in the Book of the funeral ritual means a rose-red coloured fabric.

The linens used for embalming in my specimens were either white or of a saffron or orange colour. The white linen is named *ȧṭet*. In the funeral papyrus of Gizeh this is said to be "resplendent as crystal." Most of my linen was not white but was dyed with the reddish yellow pigment, which is freely soluble both in water and spirit. Linen of this colour was

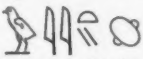
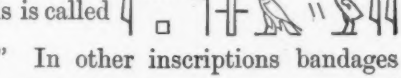
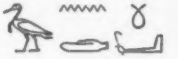
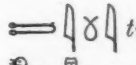
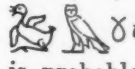
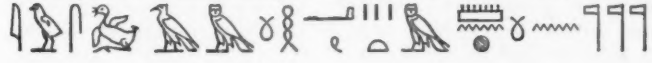
[1] Schiaparelli, "Il Libro dei Funerali," ii, 14.

[2] "Dict. Géog.," p. 303.

[3] In the inventory found in the tomb of Rahotep at Medum there are mentioned *Aā* linen, of which six kinds are specified, 100, 9, 5, 4, 2, and 1, *seunnu* of which 100, 4, 2, and 1 are given, and *neṭer*, of which 100 is mentioned, and in another place its varieties are given as 100, 4, and 2. See Petrie, "Medum," Pl. XIII, XX. There is another fabric, *tema*, mentioned in Pl. XVI, of which there were three sorts, 100, 4, and 2.

probably that called *ȧtmȧ* or dark red. The other colours used in the funeral ritual are called *uaṭ-t*, "green," and  *ạruti* or blue. In the funeral rituals such as that of the Louvre and Abydos, in the description of the later symbolical stages of the priestly operations, there is one chapter entitled  "Chapter of putting on the white bandages." After this comes the "chapter of putting on the green bandage,"[1] then that of the investiture with the light red bandages (*ȧnsi*), then that of the dark red bandages (*ȧṭemȧi*). After this, the *Usekh* collar was put on. I have found nothing in my specimens corresponding to these successive layers of different colours, so it is probable that these investitures were only symbolical, or perhaps confined to royal or great personages: at least it is certain that in all my specimens there had not been a succession of these as real ceremonies.

The mummy cloth for the bandages was torn into strips, not cut. Most of the bandages used in swathing the head and neck were narrow, averaging from six to ten cm. in width. Sometimes, however, there are broader strips twenty cm. wide, used for covering the face and body.

These bandages are often referred to in funeral inscriptions and were called *ut*. They have given one of the names to the undertaker, who was called  *uiti*, "the bandager." This application of swathes is a divine task; thus, in the Rhind papyrus, Anubis is called  "Anubis the bandager." In other inscriptions bandages are sometimes called  *bạnṭ*, and sometimes  *ti* or *tai*, and the act of bandaging is called  *ṭam*, a word which occurs in the Rhind papyrus. It is probable that there were generic differences between the bandages so differently named. In one text we are told  "Thy

[1] Schiaparelli, ii, p. 27, 30, 34, &c.

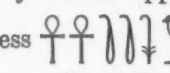
body is clothed in a garment of the gods." The word *seben*, like its Coptic derivative ϲⲉϧⲉⲛ, is also applied to bandages in general.

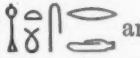
Some of these bandages on my specimens were in a remarkably good condition when taken off, requiring to be cut as they did not tear easily. We know from the story in Herodotus (vii, 181) that the same kind of linen was used for surgical bandages as for embalming; and, indeed, when these are rolled up they closely resemble the bandages out of a hospital surgery. There is a well known Greek epigram given by Brunck ("Analecta," iii, 169) which refers to this.

> Ιητρὸς Κρατέας, καὶ Δάμων ἐνταφιασὴς
> Κουνὴν ἀλλήλοις θέντο συνωμοσίην.
> Κάι ῥ' ὁ μὲν ὀὺς κλέπτεσκεν ἀπ' ἐνταφίων τελαμῶνας
> Εἰς ἐπιδεσμεύειν πέμπε φίλῳ Κρατέᾳ.
> Τὸν δ' ἀπαμειβόμενος Κρατέας εἰς ἐνταφιάζειν
> Πέμπεν ὅλους αὐτῷ τοὺς θεραπευομένους.[1]

The methods employed in applying these bandages were very varied. I have not been as fortunate as Dr. Granville, who describes finding in the mummy which he unwrapped, examples of the *couvre-chef*, the scapularium, the eighteen-tailed bandage, the T-bandage, the capistrum, and the linteum scissum. I have from time to time in unwrapping my heads, found some specimens of most artistic and elegant bandaging, but have never seen these different forms combined in one body. The commonest form of head bandage is a modification of the figure of eight. There is in many a long wide piece of cloth beneath the bandages proper coming up over the breast, over the front of the neck and face and brought down over the top of the head and nape and down the back. This agrees with the description of the bandage of *Sebekh*, in the Boulaq papyrus, and possibly with the *nemes* (Schiaparelli, ii, 9), and it is directed to be put on when the body lies on the bier with its face upturned and its back soaked in oil. Over this is a narrow bandage applied first round the neck, then crossing on the back of the head, then brought over the forehead, then backwards over the neck, then after another turn round the neck it is made to cross again on the occiput. This is probably the bandage which in the papyrus of the embalmment is called "the bandage of Harmakhis of Hebit." Over this, a second bandage of the same width is applied in an opposite direction, so as to decussate the first. This is called the bandage of Nekheb, which is said to cover the forehead. A third bandage is applied at first round the neck and horizontally across the

[1] De Quincey's happy paraphrase of this is familiar to all readers of his Essay on "Murder as one of the Fine Arts."

face ; this is the bandage of Hathor the Lady of Ânnu. This ends under the chin and finishes at the obelion. There is a fourth bandage also beginning around the neck, then passing over the occiput across the bregma, then down in front of the ear, under the chin, around the neck, then backwards over the sides of the face crossing the last on the top of the head, and so on. This is the bandage of Thoth âp-ḥerui. This bandage was probably applied as a double-headed roller. A similar bandage, I have once found, applied over this, crossing the cheeks from above downwards. This may be the appliance which is called on account of its doubleness  *ānkhtesu*, and is spoken of as "the two terui, two rolls of linen named ankhtesu." It is possible that these may be the names of the plugs of cloth sometimes forced into the mouth. The continuation of this bandage below is probably the bandage of Nebṯḥetept. Over this is another double-headed roller crossing on the vertex and under the chin alternately. This may be the band called the double *uṭa*, or else that called "the bandage of Sekhet, the great, beloved of Ptah, of two pieces for the head." Over this in some cases is an oblique bandage over the nape and forehead crossing on the nape, which is possibly the *et'et* or the white bandage.

The portion of the bandages which crosses the ears is specified as the bandage of  an excellent linen from Ḥat Ḥesmen.[1] It is to be applied over the two ears "by Thoth Âp-ḥerui, the pacificator of the gods in Unnut." The strip which fulfils this description is generally the continuation of No. 4. In all there are prescribed 22 folds on each side of the face passing over the two ears.

Dr. Pettigrew repeats more than once the statement that the bandages nearest to the body are always the coarsest. This is by no means invariable. I have often found fine cloth in direct contact with the body and layers of very various textures from this to the surface. In many, the linen was of the same texture all the way through.

Very few of the head bandages were continued over the shoulders except those closest to the body and occasionally those on the surface. In the whole mummies examined the limbs had been wrapped independently at first, then the head had been wrapped, and then the swathes of the body were applied. This is in accordance with the ritual. The fingers

[1] This is mentioned in the Papyrus of Ani, Pl. VIII, l. 26.

were swathed with linen from Saïs. On the left hand there should have been traced the figure of Hepi. The bandage of this hand is consecrated to Isis of Koptos, and the envelope was to be of six layers, with the figure of Isis, of Rā, and of Åmsu externally. That of the right hand bore the image of Nephthys, and was enveloped in twelve folds of bandages marked with the images of Rā, of Åāḥ, and of Isis and Nephthys. The bandages of the right arm are named those of Harmerui, of Åmsu-Åāḥ, and of Sept-Har, and all the bandages are consecrated to Har-hut. The feet had the toes also bandaged, but not separately, and it is directed that two jackals are to be drawn facing each other on two pieces of cloth. These bandages are the bandages of Horus, lord of Hebennu for the left leg, and that of Anubis for the right leg.

The other bandages of the body, the bandage of Ḥet-Åāḥ, made of the fine linen of Sent, the wrappings of Nehamtera and Ahai made of the linen of Panopolis, and the bandage of the royal house made of the linen of Hanes, I cannot identify. The shroud which enwraps the body was called the wrapping of Meh, a marvellous texture of Hebennu, a wrapping of linen from Edfou. The *mātait* like its Coptic derivative ⲙⲁⲧⲉ, was probably in the first instance a girdle for the loins, or an abdominal bandage, although used for bandages in general as for the ear-swathe.

The methods described in the ritual were, however, not strictly carried out in any of my specimens, and there are in each case special peculiarities in the number and arrangement of the folds too numerous to specify. In one a wide cloth was wrapped round the head and gathered into a knot on the back of the neck. This may be one of the four large pieces, which the ritual ordains for the occiput. It is not often that the method of reversal so usually practised in surgical bandaging to make the successive folds lie evenly is used on the limbs, but I have twice seen it. The several folds were applied wet and smeared with adhesive material. I have been able to extract from them some of the Κόμμι or gum Arabic which Herodotus mentions as employed to fasten them, and which was derived from the *āsh* or acacia tree of the Upper Nile. The surface must have been soft when these cloths were applied, for the texture of the cloth is impressed on the skin, which is indented by the crumples of the bandages.

In general the skill of the Uiti was exercised in making the surface of the bandages as smooth as possible, and it is probable

that each of these bandagers followed his individual taste in the process. With the deeper layers little care is taken to prevent crumpling, especially at the places where they cross, as on the nape or below the chin. The surface bandages lie evenly.

The ears are sometimes bandaged flat on the side of the head, but most commonly the folds of the bandage of Thoth pass alternately in front and behind the ear. There is in some cases an additional bandage applied over all vertically covering the ear completely. This, which was a double headed roller, is called "the completed." Sometimes a plug of cloth is forced into the fossa of the concha and the pinna bent forward over it.

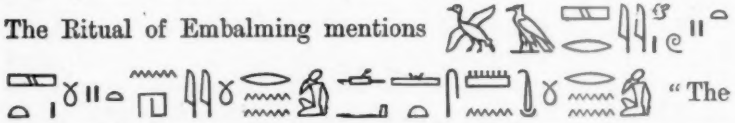
The nostrils are commonly stuffed with a small horseshoe-shaped plug of linen, one end of which is driven up each. It is well known from the description of Herodotus that the brain was usually extracted through the nostril. This was done with a hook, which the Greek historian tells us was of iron. Bronze hooks have been found, which may also have been employed for the purpose. Chabas[1] figures a hook of three teeth of this metal, and there is an apparatus whose ideograph is well known, and which has the phonetic value *kes* , which may have been used. Chabas also figures a knife seven cm. long, shaped like an animal's thigh, which was made of *bạā*, presumed to be iron. An instrument of this shape occurs in the symbolic representation of the ceremony of opening the mouth of the deceased in the tomb of Seti I, but there it is represented of monstrous size. It is named *Meskhen*, and is said to have been of iron. A similar instrument is also named *Khopesh*.[2]

Extraction of the brain through the nose has been performed in 56 per cent. of my skulls. In five per cent. it has been done through the left nostril, in three per cent. through the right, in the others the septum was broken. In two the perforator had been driven through the basisphenoid, in one the brain had been extracted through the roof of the orbit. In some the membranes had been torn out with the brain, in others they remained; in general the operation was imperfectly done. In a few specimens bandages were driven up into the cranial cavity, but in general it was only the preserving material which had been inserted. I drew four yards of bandage out of one nose. In

[1] "Études sur l'Antiquité Historique," p. 79.

[2] "Devéria, Mélanges d'Archéologie Égyptienne," 1 fasc., p. 2. Schiaparelli, vol. i, p. 105. Other unknown implements are named *Ṭuaur* and *Tuniṭot*, *Ami* and *Neterti*.

another the whole cranial cavity was filled with rags; this condition was found in one mummy by Dr. Madden.[1]

The double method of preserving the nose by the inserted plug and by the facial swathes is probably referred to in the ritual. The Ritual of Embalming mentions  "The two nostrils, two bandages; *nehi*, name of the one, *smen* the name of the other." *Nehi* may be the plug, as the verb of nearly the same spelling means to separate, while *smen* may have been the bandage which conceals and fixes the organ.

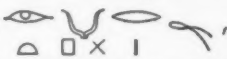
In general particular care was taken in the preservation of the face. This was under the direct supervision of Hathor, hence the ritual says, "She comes to thee, Hathor, the beautiful face, she makes thy face perfect before the gods." They were not always successful, however. In one case the nose had been broken, and a clay nose had been made to support the bandage. In another the whole face, nose, jaws, and all had been broken, and the hole plugged up with clay on a basis of rags, and carefully bandaged over. In several the perforating instrument had been driven into the body of the sphenoid, and had not entered the cranial cavity, whereupon the embalmer had given up the attempt. One head had been cut off completely through the first cervical vertebra, and a stick of sycamore wood smeared with asphalte had been driven up into the head to peg it to the spine. The head had been cut off for me low down, and so well had the bandages been applied that it was not until we had stripped them off that we detected the pre-sepulchral decapitation. At this interval of time we could not determine whether the severance of the head had been effected after death or no.

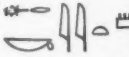
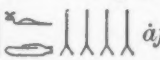
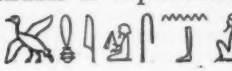
In a good many, the orbits had been filled with finely chopped rags. Five of these mummies had had the contents of the orbit removed, in the others the rags were inserted under the eyelids and in front of the shrunken eyeballs. In most cases the eyelids were closed, or nearly so. In a fair proportion, however, they were open. In only one were there enamel plaques inserted.

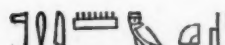
The condition of the mouth was also variable. The ritual prescribes "two pieces for the mouth, two behind and two in front."

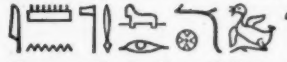
[1] Greaves records that "having caused the head of one of the richer sort of these embalmed bodies to be opened, in the hollow of the skull I found the quantity of two pounds of these medicaments which had the consistence, blacknesse, and smell of a kind of *bitumen* or pitch." In twenty of my heads the cranial cavity was quite filled with bitumen which had been injected through the nose.

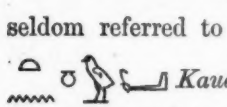
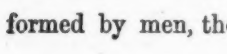
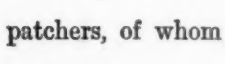
Letronne supposed that all the Egyptian mummies had their mouths open, while the Græco-Egyptians had theirs shut. I have found the mouth shut in some mummies of all periods, but most commonly they have it slightly open, and the pressure of the bandages has forced back the lower jaw. In ten specimens, the vestibulum oris was filled full of small bits of linen over which the lips were tightly drawn. These stuffed out the cheeks, and, as the teeth were closed, none of the padding extended into the cavum oris. In one, cavum oris and pharynx were full of padding. In two the cavum and vestibule were filled with sand. In two the mouth was full of old cords twisted into a ball. One mummy had a small gilt piece of wood shaped like a heraldic shield fastened on its chin by asphalte, under the bandages. On the head of a child twenty months old, a little leather cap about 10 cm. in diameter was placed over the posterior fontanel under the bandages. In about ten of my specimens the mouth was filled with asphalte, in four with a powdery resinous aromatic material like powdered sandal wood and cassia.

The necessary closure of the mouth in the process of swathing was probably the occasion of an important subsequent portion of the funeral ritual, the  "Ceremonial opening of the mouth of the Osiris." This is detailed at length in the texts published by Schiaparelli.

There are other bandages mentioned in the Papyri which I cannot identify, two called "those that fill the two eyes of Rā," said to have been placed on the vertex, and another is called  , "the ornamented bandage." In the funeral inscription of Seti I, there is also the *fi.* The  *âftu* or "fourfold linen" is sometimes spoken of as if it were descriptive of a kind of wrapping, but I know not what was its nature. I am also unable to identify the *sneb* mentioned in an inscription quoted by Dümichen "he is enveloped in the four *sneb* bandages of the linen *ṭer*." In an inscription in the Louvre Anubis is represented holding two long bandages, and saying 

 "I do the act of *sneb* to the divine prophet of Amen in the Apts (Karnak)."[1]

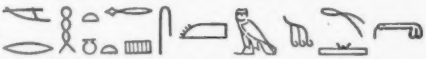
Very few of the bandages in my specimens bore the names in full. Most of them had no trace of writing, or only a simple mark. On others there was a scrawl of the name, or of the name of the Divinity under whom the bandage was applied. Inscriptions are much more regularly found on the body-bandages than on those of the head, and on the superficial swathes than on the deeper ones. On the head of one there was a drawing in ink of Isis over the left ear and of Nephthys over the right. On another was the inscription  "Amen Great God the Osiris, the governor Ḥar-ef-ḥeb, royal linen, eights." On another was indicating, possibly, the character of the linen.

In bandaging the bodies the undertaker inserted pads of cloth in all the hollows, such as those on the front of the abdomen, in order that the bandages might lie smoothly. One meets with amazing revelations on ransacking these stores of household rags, discarded garments, bits of sacking, old ropes, worn out sheets, patched napkins, &c. Some of these are darned with great neatness, others are patched with bits of linen of different textures. The process of mending which these exhibit was well understood by the Egyptian housewife, although but seldom referred to in the texts. The word  *Kauatennu* which is used for mending in some texts, may apply to this process as well as to the coarser kind of repairs for which it is used in the Anastasi Papyrus (1, 2, and 7). If we may judge from the text of the instructions of Tuaufsakhrat in the Anastasi Papyrus (vii, 3, 3,) these mendings were performed by men, the  *sekhennuiu* or patchers, of whom it is said 

[1] E. 3863. It is right to say that except for the figure of Anubis with the bandages and the use of the word in the former quotation, this passage would naturally seem to mean "I preserve the divine prophet," &c., this being the commoner usage of the word. I do not know what kind of fabric *ṯer* was. In the Rosetta inscription it is coupled with *peku*, and in the Rhind papyrus with the prefix *neter*, "divine." It was probably the same as *suten seṯ*.

. "He passes the day in cutting away the rags, the clothes are abominable" (Sallier Papyrus, II, 9).[1]

There are also hemmed bits of needlework overstitched and with herring-bone stitching. On the whole these fragments reflect credit on the thrift of the Egyptian housekeeper, but give us a low view of the morality of the undertaker, who, doubtless being paid for the best material and for a first class funeral, used up his refuse stuff for this purpose. These were not the *hebs menkh* for which the deceased so continually invokes Anubis.

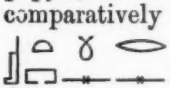
Concerning the amulets placed on the body I have nothing new to add, and I have very little new to note regarding the materials used as antiseptics. Some few of my mummies were apparently only salted, although carefully bandaged; others were thoroughly impregnated with asphalte, which was evidently melted when the bodies were immersed in it. This heating was in one mummy carried almost to the point of calcination. One mummy in which there was no trace of asphalte was calcined in like manner. The asphalte was vitreous, or in some semi-fluid and sticky, apparently mixed with pitch from Byblus, and probably with the resin from Phœnicia and Coptos mentioned in the ritual. The  "oil of the black stone," probably some form of asphalte or bitumen was prescribed as an application to the feet, legs and thighs before they were enwrapped. I have found such a material in a thin layer soaking the deepest bandages both here and on the head. The saline material found is chiefly impure common salt, with some nitrates and carbonates of sodium and potassium.

There are a few points worthy of note as to the condition of the hair in these heads. In most it had been cut more or less short, sometimes closely shaven. In a small percentage it had been left long. Usually, however, it was plastered down on the head with gum, bitumen or some thick resinous oil, probably the oil of cedar so much used. In one singular case the hairy scalp had been removed, the head covered with a layer of oiled bandages, and the scalp replaced and covered with the "bandage of Nekheb." In another remarkable instance,

[1] Maspero translates *sekhennuiu* as "dyers" ("Le Genre Épistolaire," 1872, p. 6) and this meaning is adopted by Birch ("Records," viii, 132). The context, however, speaks of torn clothes. *Âsi* were apparently coarse clothes, the wearers of which are contrasted with the better class who wore *peku*, in a passage in a Leyden papyrus.

the head of a wrinkled, toothless old woman of extremely witch-like appearance, I was surprised to find that there was a considerable amount of hair of a lightish colour on the head under the bandages. On the application of warm water all this at once became detached and the locks proved to have been gummed on the surface of the head, which was bald and bare. One would like to have known something of the history of this prototype of Pope's "Narcissa." One lady had large masses of fair coloured hair much resembling in colour that resulting from the action of hydrogen peroxide. Another had a thick crop of moderately long black hair.

Whiskers and beard were usually shaven. I have only twice found anything like a distinct beard and moustache. Only one head was genuinely woolly like that of a negro; in many the hair was dark reddish brown, probably the result of the action of time and reagents. In many of the oldest heads the flesh had been removed from the skull and the bone carefully bandaged. The hair, when long, was usually cut squarely across the forehead, and there is often a median division. The wigs, which were probably worn during life, were not left on the heads, and in only one were the locks plaited. I did not find in any a trace of the conventional chin beard which in the monuments characterises men and the male gods, and which was, as the representations of it show, an artificial appendage tied on.

Summing up this detailed account of the mode of preparation, one is forced to the conclusion that the ritual method of enwrapping of the later time, as described in the papyri so often quoted, was only one of many ways in which the heads were enwrapped, and probably embodied a later tradition which had not been fully elaborated in the times before the dates of these papyri, or which, at least, was only used in all its details in a comparatively small number of cases, by the officials of the  or "house of the bandages."[1]

Discussion.

Dr. Garson said, in reference to the use of coarse cloth next the body which Prof. Macalister had mentioned he had met with sometimes in Egyptian mummies, it was not improbable that it was used designedly for the purpose of allowing a greater quantity of preserving medium to come in contact with the body than would be the case if fine texture cloth were used, as the interstices between

[1] None of my specimens showed the elaborate patterns of body bandaging like those found by Mr. Petrie at Hawara (p. 14). Since this Paper was printed I have received Dr. Budge's excellent book "The Mummy" (Cambridge, 1893), and Forrer's beautifully illustrated "Gräber von Achmim" (Strasburg, 1891), both of which contain additional information.

the threads of the coarse mummy cloth are larger than in the fine varieties.

As regards the removal of the brain through the nostril. This procedure was not practised in the earlier times, as in a series of twenty-three specimens of Egyptian mummies of the 4th Dynasty which he had examined, obtained by Mr. Flinders Petrie from Medum, in not a single instance had the brain been removed.

The removal and preparation of the scalp and its subsequent replacement, mentioned in the paper, is interesting from the fact that this procedure is followed in a part of the world very remote from Egypt, namely, in Mallicollo Island, one of the New Hebrides group.

Mr. STOPES confirmed Professor Flower's wish that Professor Macalister might visit Egypt, as notwithstanding the many observers who had already examined and reported upon that country, it would be a material benefit to Anthropology generally to have such skilled and searching criticism as would doubtless be given by him. When in Egypt, he (the speaker) had been struck when observing the remarkable differences in the linen that enwrapped the mummy cats at Siout, the apis and other mummies at Sakkara, and the great diversity of the qualities of the linen so profusely scattered on the desert at Thebes and at the tombs of the kings in the valley of Bab-el-Moulouk. It did not seem that the quality or fineness of the linen was a reliable index to the status of the mummy when in life. The fact that in some of the mummies of the very early dynasties, linen of such exceeding fineness was employed, was indicative not only of the high development to which weaving had at that time attained, but of the great length of time needed for such development in the art. Such wonderful workmanship needed generation after generation of skilful workers. Practically there has been little or no improvement in the quality of some linen manufactures for upwards of 4,000 years.

DESCRIPTION *of* TWO SKULLS *from* NAGYR.

By W. LAURENCE H. DUCKWORTH, B.A., Scholar of Jesus College, Cambridge.

To the Cambridge University Collection there have recently been added two skulls from the capital of Nagyr, a small state in Central Asia.[1] By the kindness of Prof. Macalister I am enabled to give the following description of them :—

The skulls are numbered 1204 and 1205 respectively, in the Cambridge catalogue, the measurements which were made with

[1] The skulls were obtained by W. M. Conway, Esq., during his late mountaineering expedition in the Hindu-Kush district.

Flower's Craniometer and a steel tape, are given in millimetres.

The skull 1204 is a female skull whose sex is indicated by an inconspicuous glabella, faintly defined superciliary ridges, temporal ridges and external occipital protuberance, slender zygomatic arches. It is in a good state of preservation, the left side being a good deal more bleached than the right; no remains of skin or adhering hairs are to be seen. The more conspicuous parts missing are as follows: the lower jaw, all the teeth except four (first and second molars on either side), the lachrymal bones, the hamular processes of the internal pterygoid plates, the left styloid process (that on the right side though quite short (8 mm.) does not appear to have been broken off). The os planum of the ethnoid is much damaged on either side.

This skull is fairly symmetrical; the right parietal eminence is the more pronounced; on the left side is a parietal foramen.

At the right asterion are three large wormian bones, and at the left asterion a single one. The temporal ridge of the right side is more pronounced than that on the left (and the remaining molar teeth of the right side have larger dimensions than those on the left). There is a post-condylar foramen of large size on the right side, in front of and external to which is a remarkable eminence perforated at the top where the bone is thinned out. This is due to pressure of the right sigmoid sinus causing absorption of the bone and consequent dilatation of the sinus in this region (just before its termination). The anterior condylar foramina are large but neither is subdivided. The foramen spinosum is incomplete on either side, but this is possibly due to injury. The nasal bones are curiously asymmetrical. The suture between them is oblique in direction and at its highest point is 3 mm. to the left of the remaining trace of the metopic suture, whereas its lower end reaches to the middle line of the face; the width of the nasal bones at their upper ends varies correspondingly, for the right nasal bone is 6 mm. and the left, 4 mm. wide at this end. The anterior opening of the nose is also asymmetrical, the right superior maxillary bone being hollowed out to a much deeper level than is the left; the septum of the nose is strongly deflected to the left.

The dentition has been perfect. The premaxillo-maxillary suture is still visible; the sagittal suture shews no signs of synostosis nor has the spheno-basilar suture yet synostosed. These facts assign an age of from 18 to 21 years to this skull.

The general shape and contours are of a refined type, the forehead being high, no prominent glabella, distinct frontal eminences with a slight flattening immediately posterior to these. The curve of the vault reaches its culminating point

just at the bregma and begins to descend some 40 mm. posterior to this point. From the obelion, the posterior curve continues to the lambda, after passing which it is interrupted by a considerable bulging out in the region immediately above the inion.

In norma verticalis the skull is seen to be cryptozygous and dolichocephalic. The breadth-index, 69·94 is remarkably low. There is a depression at the level of the upper part of the temporal ridge, below each parietal eminence, below which again is an eminence above the mastoid process and it is at this level that the breadth of the skull is greatest. The transverse arc is quite regular, no flattening or upraising at the vertex. The mastoid processes are small, in fact feminine, and the same description applies to the face generally.

The coronal, sagittal, and lambdoid sutures are of moderate complexity. In the coronal suture just above the left stephanion appear the remains of a wormian bone, interrupting the suture for some 15 mm.; ossification has taken place around the circumference for about half its extent. The sagittal suture becomes more simple for a space of 25 mm. in the region of the obelion. The lambdoidal suture is characterized by the wormian bones already referred to. On the right side there is a large foramen in one wormian bone and another in the base of the mastoid process.

On the left side are two foramina near the base of the mastoid process, formed by the juxtaposition of notches in the borders of the temporal and occipital bones respectively. The metopic suture persists for a distance of 2 mm. only.

This skull weighs 419 gms.; decidedly light. The cranial capacity (using No. 8 shot) is 1470 c.c., an exceptionally high figure for a female skull. As regards the face; the orbits are mesoseme, and droop slightly and externally; there are shallow supra-orbital notches. The nose is mesorrhine and the lower margins of its anterior opening are rounded, the spine is small and the profile outline is nearly straight. There is a well marked depression immediately below the infra-orbital foramen. The palate is distinctly elliptical, of no great depth; the posterior nares are small. The occipital condyles are small, their inner and anterior lips are prominent and not much elevated above the plane of the foramen magnum.

An internal occipital protuberance can be felt and the torcular herophili seems to have been situated on its left side.

Turning now to the skull No. 1205, a series of contrasts present themselves. No. 1205 is a male skull—the prominent glabella, superciliary ridges, occipital protuberance and mastoid processes as well as the stoutness of the zygoma, indicate this. It is not in so good a state of preservation as is No. 1204, and

the following parts are wanting:—The lower jaw, styloid processes, right internal pterygoid plate, left hamular process, left inferior turbinated bone, the posterior part of the vomer and the left lachrymal bone. Three teeth alone remain and the alveolar arch has undergone a considerable amount of absorption.

The most striking features are: the rough and uneven surface; very marked dolichocephaly (index 68·28), considerable flattening in the region of the obelion, where there are two parietal foramina; the skull is also slightly plagiocephalic. There are two wormian bones on the right side below the asterion. The appearance of the condyles is noticeable. The left condyle is subdivided by a somewhat oblique sulcus so as to present two oval articular areas. The articular surface of the right condyle is constricted, at about the same level, but is not completely interrupted.

There is a post-condylar foramen on the right side. The outer pterygoid plates are much everted and on the left side a bridge of bone connects the base of the external pterygoid plate with the base of the spine of the sphenoid. This is the superior variety of the pterygo-spinous ligament ossified. On the right side a depression exists immediately external to the external pterygoid plate.

The age of this skull is not very closely indicated. The third molars on either side have been lost and their alveoli closed and since ossification is just commencing in the sagittal suture in the region of the obelion, it may be assumed that the person had passed middle age. The general contour is characterized by the very prominent glabella, with a depression immediately above it, the curve of the vault reaches its maximum about 25 mm. posterior to the bregma, and the region of the obelion is much flattened as has been already remarked. Beyond the lambda there is a considerable bulging out of the occipital bone, reduced at the occipital protuberance, whence a well marked occipital crest descends to the opisthion. Altogether this contour is somewhat irregular, contrasting strongly with that of No. 1204.

On a horizontal plane, *i.e.*, in norma verticalis the skull is seen to be phænozygous, and its left side is somewhat flattened. The transverse arc in the region of the coronal suture is quite regular. Posterior to this, the highest point of the arc is seen to be at a distance of 17 mm. to the left of the middle line; still more posteriorily this arc is interrupted by the flattening in the region of the obelion.

The sutures are moderately complex. The outline of the squamous portion of the left temporal bone overlapping the parietal bone, is noticeable as it culminates in a sharp spine vertically above the external auditory meatus; on the right

side the outline of the corresponding suture is more regular. The remaining teeth are of large size and shew signs of having been well used. The cranial capacity, 1375 c.c. and the weight, 667 gms., afford contrasts with the skull No. 1204.

The orbits are mesoseme; though their respective indices differ considerably; there is a supra-orbital notch on the right side and a supra-orbital foramen on the left side. The lower margins of the anterior nares are rounded; the nose is mesorrhine inclined to the leptorrhine type; the nasal spine is large. The alveolar index shews that the skull is orthognathic, but is not reliable owing to the absorption of the alveolar arch, the effect of which, aggravated by the length of time that has elapsed since the skull was interred, is to reduce the basi-alveolar length. The palate seems to have been elliptical. Traces of a premaxillo-maxillary suture remain, but these are lost near the middle line of the palate.

There is a somewhat large foramen in the basi-occipital on the lip of the foramen magnum midway between the condyles, corresponding to the attachment of the suspensory ligament of the odontoid process of the axis. The internal occipital protuberance corresponds in position with the external, and the torcular herophili was situated on the right side of this point.

Such are the characters of the two skulls. The contrasts between them arise rather from differences of sex and age than from any other causes. Their type is Caucasian in spite of the low figures representing their respective cephalic indices. There may be compared with them the following examples :—

First, the series of skulls from the Hindu-Kush, described by Dr. Garson in 1888. (i.) These came from localities at distances from Nagyr of thirty to one hundred miles. Of the five skulls two are dolichocephalic, the remainder are mesaticephalic; the most dolichocephalic had a breadth index of 72·3, and a general comparison of their measurements with those of the two Nagyr specimens brings to light a general resemblance.[1]

Secondly, there are two skulls from Srinagar (the capital of Kashmir), briefly described by Capt. Cunningham (ii.) in 1854. Sketches of the two skulls (a male and a female) are given, and the difference between these skulls and the shorter skulls with wider zygomatic arches of tribes more Mongolian in type is noticed. No measurements, however, are given. From the sketches, a general resemblance to the Nagyr skull is apparent, more particularly as regards the shape of the palate in the

[1] Dr. Garson has remarked on the prominent brow-ridges common to the Nagyr skull, No. 1205, and to the Hindu-Kush skulls, also on approximation of the cranial capacity in one case.

female skull. The same sketches are referred to in the "Crania Ethnica" of Quatrefages and Hamy.

In the third place, are the skulls presented to the Société Anthropologique de Paris by M. de Ujfalvy in 1882 (iii.); they are described as having been obtained from a Mussulman cemetery in Kashmir. A committee was appointed to examine and report on the skulls, but so far no report has been available.

Turning to measurements on living persons there may be mentioned M. de Ujfalvy's account of a native of Hunza whom he measured. (iv.) This man was dolichocephalic with a cephalic index of 73·84. To obtain the corresponding index for the skull itself, two units should be subtracted according to Broca ("Bull. Soc. d'Anthrop.," 2nd series, vol. iii., 1868). The resulting index of 71·84 is quite comparable with the foregoing instances. M. de Ujfalvy at the same time took measurements of a native of Naghar (? Nagyr), but these were not placed on record in the Society's report.

Such are the cases for direct comparison. On looking through the catalogue of the museum of the Royal College of Surgeons, the following crania from Hindustan seemed to present points of similarity to those from Nagyr, viz., Nos. 632, 634, and 670; their measurements have been tabulated with those of the Nagyr skulls (Table II).

As to the character and mode of life of the inhabitants of Nagyr, there is some little diversity of opinion expressed by travellers. The name is almost invariably coupled with that of Hunza; Nagyr and Hunza are the chief towns of two small states (of the same names respectively) and are situated on opposite sides of a tributary of the Gilgit river. The whole district is also referred to as Kanjut, and is on the frontier between Kashmir and the Pamirs. Of the inhabitants of Hunza, but one opinion is expressed: that they are dangerous brigands. This description has been extended to the natives of Nagyr by some writers; others assign to them a more peaceful occupation.

Of modern writers, the traveller Vigne, in 1842, referred to the goldwashing carried on at Nagyr, and also to the renowned beauty of the women (v.)

Capt. Cunningham (*op. cit.*, (ii.) p. 38) says, "Hunza-Nager is a small tract of country situated on the upper course of a large feeder of the Gilgit river." . . . . "I presume that this district was formerly inhabited by the Dards, and that they were displaced by the Kirghiz nomads." The cranial characteristics of the Kirghese described by Topinard ("Revue d'Anthropologie," 1887), do not support this view.

In 1869 Dr. Leitner made the first of a remarkable series of

contributions to the literature of this subject. In a communication (vi.) to the Anthropological Society in this year (1869), Dr. Leitner stated that, "Khajuna is the remarkable language of Hunza and Nagyr." . . "Although not unacquainted with a variety of languages, I was unable to find any connection between the language of Hunza-Nagyr, and that of any other country." . . . . "The people of Dardistan seem to have the remnants of an old civilization somewhat resembling the purest parts of the Aryan polity. This has, however, been obscured by the introduction of Mohammedanism into the country." . . . . "the position of woman is in every respect higher than among the Hindus."

Other writings of the same author describe the Nagyris as "short and stout, and fairer than the people of Hunza," who are described as "tall skeletons," and are "desperate robbers," and again "the people of Nagyr are a comparatively mild race; they carry on goldwashing," with historical references to this occupation of the Dards by Herodotus, Ptolemy, and native Kashmirian chroniclers (vii.).

Other accounts (viii.) published by Dr. Leitner (including the "Hunza and Nagyr Handbook," 1889) give additional information, but are perhaps rather of philological interest. In 1891 (ix.), reproductions of photographs of Nagyris were published, and it was stated that "Hunza and Nagyr are but one tribe divided into two rival sections." Still more recently the difference in character of the two are strongly insisted upon (x.). Dr. Leitner hopes to publish a series of measurements of this people which will doubtless be of much value.

Other descriptions of the Dards are given by Drew (xi.). They are supposed to have come from the North and North-east (reference to Sir G. Campbell's work being made). The same author (xii.) again says: "Whether we judge from language or physiognomy, the conclusion is inevitable that the Dards are an Aryan race." Their castes are enumerated; the Shîns and Yashkuns being regarded as the most ancient, and as composing the race, called Dard, that invaded the country, and took it from earlier inhabitants. The Yashkun without any Shîn are found in Nagar.[1] Gen. Maclagan (xiii.) considers these tribes as Aryan. Lieut.-Gordon (xiv.) states that the people of Hunza and Nagyr are alike in character and religion and describes them as having "an evil reputation with their neighbours, as robbers and man stealers, treacherous, cruel, and cowardly."

The description of a native of Hunza, by M. de Ujfalvy, has

[1] Mr. Conway, however, says "the people are something of a mixture (Yashkuns, Shînas, and lower caste of earlier folk)." Letter to Prof. Macalister.

been referred to (iv.). M. de Ujfalvy thought this man resembled the natives of Herzegovina.[1] The features were thus described "des sourcils épais allant sans interruption d'une bosse sourcilière à l'autre; des bosses sourcilières peu pronoucées, et la dépression entre le nez et la glabelle, presque nulle"; the profile resembled that of a Greek statue.

In a review of Dr. de Ujfalvy's "ethnologische Beschriebung der Völker Central Asiens," the author's classification of these races is appended, in which the "Khadschuna" are placed in a subgroup under the group "Die Hindu-Kusch Inder"; while "Die Darden" fall within another subgroup under the same group (xv.)

Sir W. W. Hunter (xvi.) thus notices this people, "The people of Hunza and Nagyr belong to the caste called Yeshkún by the Shîns of Gilghit, but known among themselves as Búrish. . . Mohammedanism sits but loosely upon them"; while Dr. G. Capus (xvii.) refers to Tomaschek's opinion that "la peuplade des Kachounas dans le Dardistan sout un reste de ces aborigènes non-ariens parce qu'ils possèdent, ainsi que les Kafirs, les Daradas, et certains Tadjiks de la montagne, une méthode de compter vigésimale." A general account of the tribes of this district is given by Prof. E. E. Oliver (xxi.), and reference to the appearance of the Hunzas by Mr. E. F. Knight (xxii.).

Dr. Leitner, as has been said, described the language spoken by the inhabitants of Hunza-Nagyr as unconnected with any of the neighbouring dialects. On this subject the following light was thrown by Dr. Hyde Clarke (xviii.). This language (the Khajuna) was for some time unclassified since it has no neighbouring congeners. The group of languages furnishing the key to it has representatives in Abyssinia, Caucasia, and the Indian Archipelago; a Siberian class and two American classes are also related, as is also the Rodiya or language of the Pariahs of Ceylon. This group, the Sibero-Nubian, must have had possession of the whole of India before the advent of the Dravidians. Col. Biddulph classifies the languages of Dardistan thus: (1.) Boorishki or Khajuna . . the language of the Boorish or Yeshkuns spoken in Hunza, Nager, and Yassin; (2.) Shina, spoken at Gilgit; (3.) Khowar, the language of Chitral (xix.).

M. de Ujfalvy says the language of Hunza-Nagyr is non-aryan, and (presumably) separates the "Khadschuna" from other Dards. He refers to the opinions of Tomaschek and Biddulph,

[1] The Hunza man had a cephalic index of 73·84; whereas in a summary of the Anthropology of Herzegovina, Dr. Weisbach (Vienna) describes the natives of the latter country as Hyper-Brachy-cephalic (index 87·2). "Revue d'Anthrop.," 3 Série, Tome iii, 1888, p. 742.

as to the meaning and origin of the terms "Khazunah" and "Burich" respectively (xx.).

In accordance with the affinities of the Khajuna language as described above, a comparison has been instituted between the measurements of the Nagyr skulls on the one hand, of those of various natives of Ceylon on the other. A general review of the figures shows that the two Nagyr skulls resemble each other more closely than any of the skulls compared with them (see Tables III. or IV.); the most interesting comparison is afforded by the data for the Rhodias of Ceylon (presumably the Rodiya mentioned by Dr. Hyde Clarke).

TABLE I.

MEASUREMENTS OF THE SKULLS ARE IN MILLIMETRES.

INDICES.	Skull, ♀ Nagyr, 1204.	Skull, ♂ Nagyr, 1205.
(Bi) Cephalic..	69·94	68·28
(Hi) Vertical..	69·94	70·43
(Ai)Alveolar	95 ?	97·10 ?
(Oi) Orbital	86·43 (R)	82·06 (R)
(Ni) Nasal	50	52·72
Stephano-zygomatic	97·5	82·4
Palatine	115·4	..
Naso-malar	110·50	113·33

CRANIAL CAPACITY.	1470 c.c.	1375 c.c.
Maximum Antero-posterior Length	183	186
Maximum Transverse Diameter	128	127
Basi-alveolar Length	95 ?	101 ?
Basi-nasal Length	100	104
Basi-bregmatic Length	128	131
Length: Basion to Inion	63	87
„ „ Opisthion	31	38
„ Opisthion to Glabella	137?	144
„ Nasi-alveolar	60	75?
„ of Spheno-parietal suture	10	15 R 17 L
Breadth of Foramen magnum	27	29
„ from Pterion to Pterion	104	112
„ from Stephanion to Stephanion	117	103
„ from Asterion to Asterion	105	104
„ Bizygomatic	120	125
„ Bi-maxillary	89	96
„ Interauricular	107	113
„ Minimum Interorbital	19	22
„ Minimum Frontal	101	95
„ Bi-orbital (at Fronto-malar suture) ..	102	101
Orbital Breadth	37	39
Orbital Height	32	32

TABLE I—continued.

	Skull, ♀ Nagyr, 1204.	Skull, ♂ Nagyr, 1205.
Nasal Breadth	22	29
Nasal Height..	44	55
Maximum Length of the Palate	52	57?
Maximum Breadth „ outside arch ..	60	64
„ „ „ inside arch ..	42	45?
Arcs:—		
Antero-posterior curve. Frontal arc.. ..	129	123
Parietal arc ..	125	122
Arc from Lambda to Inion	88	65
„ Inion to Basion	63	94
„ Inion to Opisthion	32	55
Supra-auricular arc	302	307
Jugo-nasal arc	105	110
Breadth at external border of Orbits for Naso-malar Index	95	98
Horizontal circumference	508	507
Posterior Nares—		
Maximum Breadth (between Intl. Pterygoid plates)	27	30
Height	23	23
Length of Interpalatine suture	14	17
The Superior Maxillary Bone—		
Maximum Height	57	72?
Mean Height	35	47
Minimum Height	17	23

DIMENSIONS OF TEETH. Skull, ♀ Nagyr, 1204.

	Antero-posterior diameter.	Transverse diameter.
On the Right—		
Molar 1	10	11
Molar 2	9	10
On the Left—		
Molar 1	7	10
Molar 2	8	8

Skull, ♂ Nagyr, 1205.

	Antero-posterior diameter.	Transverse diameter.
On the Left Side—		
2nd Premolar ..	7	8
1st Molar	11	11
2nd Molar	10	10

TABLE II.

COMPARISON OF MEASUREMENTS OF SKULLS FROM NAGYR with those of Skulls from the Hindu-Kush described by Dr. Garson (i.) and with isolated examples of Dolichocephalic Skulls which were obtained from other parts of Hindustan.

Skull.	Horizontal circumference.	Maximum Length.	Maximum Breadth.	Breadth Index.	Height.	Height Index.
Nagyr (1204)	508	183	128	69·94	128	69·94
Nagyr (1205)	507	186	127	68·28	131	70·43
Gound :						
No. 634 in the catalogue of the Roy. Coll. Surgeons ..	505	188	127	67·6	134	71·3
Hindu-Kush B	515	181	136	75·1	128	70·7
„ C	483	177	128	72·3	123	69·5
„ D	500	178	134	75·8	129	72·5
„ E	508	176	140	79·5	127	72·1
„ F	490?	179	133	74·3	128	71·5
M. de Ujfalvy's Hunza (iv.) ..	?	?	?	73·84 (71·84)	?	?
Skull from Madura, 670 in catalogue of Roy. Coll. Surgeons	507	184	124	67·4	143	77·7
Skull of a Mussulman, 632 in catalogue of Roy. Coll. Surgeons	512	189	125	66·1	132	69·8

TABLE III.

COMPARISONS OF MEASUREMENTS OF NAGYR SKULLS with those of Living Rhodias.

Skull.	Craniometric.		Anthropometric.	
	Nagyr, 1204 (female).	Nagyr, 1205 (male).	Rhodia (male).	Rhodia (female).
Antero-posterior diameter ..	183	186	190·66 (6)	181·66 (6)
Maximum transverse diameter	128	127	139·5 (6)	137·81 (6)
Cephalic Index..	69·94	68·28	73·16	75·86
Horizontal circumference ..	508	507	541·16 (6)	544·66 (6)
Minimum frontal breadth ..	101	95	106·16 (6)	94·83 (6)
Bizgomatic breadth	120	125	120 (12)	
Bi-auricular breadth	107	113	117 (12)	
External Bi-orbital breadth ..	95	98	98·66	

The above measurements of Rhodias are given by M. Emile Deschamps in

his account of "Les Veddas de Ceylan," in "L'Anthropologie" for 1891; photographs of male and female Rhodias are also given; in the profile view of a Rhodia chief, the brow presents the same feature of prominent glabella with a depression immediately above it, as does the male skull from Nagyr. The figures in the table above, when allowance is made for the difference between Anthropometric and Craniometric observations, afford some interesting comparisons; those of the respective horizontal circumferences being remarkable. Topinard (xxv.) states that for a skull with a circumference of 508 mm. (horizontal) there should be added 35 mm. to approximate to the corresponding Anthropometric measurement. In the case of Nagyr, 1204, this would give 543 mm., and for Nagyr, 1205, the anthropometric equivalent would be 542 mm.

TABLE IV.

COMPARISON OF MEASUREMENTS OF SKULLS FROM NAGYR with those of Skulls of Natives of Ceylon other than Rhodias.

Skull.	Nagyr, 1204 ♀.	Nagyr, 1205 ♂.	Veddah ♂.	Veddah ♀.	Tamil ♂.
Capacity	1470	1375	1277 (22)	1139 (10)	1336 (13)
Height Index	69·94	70·43	73·8 (21)	73·2 (10)	73·6 (13)
Basi-Nasal Length ..	100	104	98·7 (18)	93·4 (8)	102·5 (13)
Basi-Alveolar Length ..	95	101?	94·2 (16)	88·3 (8)	99·7 (10)
Alveolar Index.. ..	95	97·10	95·2 (16)	94·5 (8)	97·7 (10)
Orbital Index	86·43	82·06	89·2 (21)	89·4 (10)	86·7 (10)
Interorbital breadth ..	19	22	22·2 (21)	21·7 (10)	23·5 (13)
Nasal Index	50	52·72	52·5 (21)	52 (8)	53·7 (13)
Cephalic Index.. ..	69·94	68·28	71·6 (21)	71·2 (11)	70·8 (13)

The measurements of the Veddah and Tamil skulls are those given by Drs. Paul and Fritz Sarasin (xxiv.). The numbers in brackets indicate the number of skulls whence the average is deduced.

Dr. Deniker has most kindly communicated detailed measurements of the series of skulls of Cashmiris, presented to the Société Anthropologique de Paris by M. de Ujfalvy. The series comprises six skulls of males and three of females. Apart from measurements, Dr. Deniker says that the prominence of the inferior nasal spine and the shape of the apertura pyriformis of the nose (that of an ace of hearts), are characteristic of this series. For the measurements, the following arrangement exhibits the principal features, with which those of the skulls from Nagyr may be compared :—

Skull.	Breadth Index.	Height Index.	Nasal Index.
Nagyr, 1205	63·28	70·43	52·7
Average of five male skulls from Cashmere	73·28	70·7	48·3
Extremes .. .. .. {	75·6	73·4	54·7
	70·6	65·8	41·5
Cashmere skull, No. 9 (male) ..	65·6	67·2	?

No. 9 is described separately, as Dr. Deniker suspects doformity.

FEMALE SKULLS.

Skull.	Breadth Index.	Height Index.	Nasal Index.
Nagyr, No. 1204	69·94	69·94	50
Cashmere, No. 5	72·3	74·7	51·1
„ No. 6	74	70·7	43·8
„ No. 4 (Child?)	75·9	77·7	54·5

The conclusion is, that the skulls from Nagyr might well fall into a group including these skulls from Cashmere, except as regards their breadth-index, though even this pronounced feature is surpassed by one of the Cashmere skulls. It seems probable that this may prove to be a specific distinction of skulls from Hunza-Nagyr.

REFERENCES.

i. Dr. J. G. Garson. "Journal of the Anthropological Institute." Vol. XVIII. 1889.
ii. Capt. Cunningham. "Ladakh and the surrounding countries." 1854.
iii. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris," 3e Série, Tome V. 1882. p. 212.
iv. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris," 1881. p. 600.
v. Vigne. "Travels," 1842. Vol. II. p. 288.
vi. Dr. G. W. Leitner. "Journal of the Anthropological Society." Meeting of Nov. 30th, 1869.
vii. Dr. G. W. Leitner. "Indian Antiquary." Jan. 5th, 1872. p. 8.
viii. Dr. G. W. Leitner. "Report of the British Association." 1875. p. 176.
ix. Dr. G. W. Leitner. "Asiatic Quarterly Review." New Series. Vol. II. July, October, 1891. pp. 139, 204, 243.
x. Dr. G. W. Leitner. "Asiatic Quarterly Review." New Series. Vol. III. January, April, 1892. p. 53.
xi. Drew (F.) "British Association Report." 1874. p. 149.
xii. Drew (F.). "Northern Barrier of India." 1877. p. 167.
xiii. Gen. Maclagan. "Encyclopædia Britannica." Article "Kashmir."
xiv. Lieut. Gordon. "The Roof of the World." 1876. p. 139.

xv. "Archiv für Anthropologie." Vieweg u. Sohn Braunschweig. Band 17 1887.
xvi. W. W. Hunter. "Imperial Gazetteer of India." 1886. Vol. V. Article "Gilghit."
xvii. Dr. G. Capus. "Revue Scientifique." III^e Série. Tome XVII. Jan. to July, 1889. p. 7.
xviii. Dr. Hyde Clarke. "Indian Antiquary," 1872. August 2nd.
xix. Col. Biddulph. "Journal of the Royal Asiatic Society." Vol. XVII. New Series. 1885.
xx. M. de Ujfalvy. "Bulletin de la Société Anthropologique de Paris." Séance du 16 Mars, 1882. p. 226.
xxi. Prof. E. E. Oliver. "Pathan and Biloch." 1890. pp. 320–327.
xxii. E. F. Knight. "Where three Empires meet." 1893. (Longmans).
xxiii. Emile Deschamps. "Les Veddas de Ceylan." L'Anthropologie. 1891.
xxiv. Paul and Fritz Sarasin. "Ergebnisse Naturwissenshaftlicher forschungen auf Ceylon." 1893.
xxv. Dr. P. Topinard. "Eléments d'Anthropologie Générale." 1885. p. 711.
xxvi. Biddulph. "Races of the Hindu-Kush."

Discussion.

Dr. Garson remarked that the specimen of the male cranium agreed very closely in its characters with a series of five crania described by him in the Journal of the Institute in 1888, from the same district. One of the most noticeable characters of the skull is the great development of the supra-orbital region, which forms, as it were, a prominent bar across the forehead. About four years ago he had an opportunity of seeing some photographs of the people, exhibited at the Institute by Dr. Leitner, of Woking, which showed that this feature is equally characteristic of the living subject. He handed round a photograph which had been presented him by Dr. Leitner, of a group of natives of different tribes from the place where the skulls were obtained. Specimens from this region of Asia are very difficult to obtain, and consequently their affinities to neighbouring nations are little known. From his examination of the specimens he had described he had come to the same conclusion as Mr. Duckworth, viz., that there was certainly no trace of Mongolian affinities in them. The average cranial capacity of four of his specimens was exactly the same as that stated by Mr. Duckworth to be the capacity of the male cranium. The female cranium on the table was the first one of that sex he had seen.

Damma Island *and its* Natives. By P. W. Bassett-Smith, Surgeon R.N.

[with plates viii, ix.]

In November, 1891, while serving on board H.M. surveying ship "Penguin," it was my good fortune to visit Damma Island, one of the largest of the Serwati group in the Banda Sea, in latitude 7° 08′ S., longitude 128° 40′ E.

It is almost half way between Timor and Tenimber Island (Timor Laut), and is also almost intermediate between Port Darwin and Amboyna, being thus passed en route from the former place to Hong Kong. An occasional trading steamer calls at this island, as at Tenimber, and it is nominally ruled by the Dutch; the only official representative, however, was a "Postholder," an ancient Macassar man, who came off to the ship wearing a black coat and fez, carrying a gold-headed stick, bearing on it the Netherlands arms; but he was very poor, and eagerly accepted biscuit, or anything else that was offered to him; with him were his family and a few other Malays, who all lived together, and from them I gathered that there was very little fever in the island, and not much game. These younger Malays occasionally acted as guides, yet I believe the island is practically unknown to Europeans, and the racial character of the inhabitants doubtful. The only mention I have been able to find of them being in Stanford's Compendium, "Australasia," where Mr. Wallace states that they are like those of Wetter Island (which is a little further west), who again are like those of Timor, and therefore probably belong to the sub-Papuan type; this being so, our visit was particularly interesting, and as many facts and observations, as well as Natural History and other specimens, were collected during our short stay of five and a half days as possible. But one cannot too strongly bear in mind Mr. Wallace's caution as to the drawing inferences, or speaking dogmatically of the exact nature of the races of these islands, without long residence among them, and especially without some knowledge of the languages. These people, however, certainly present many marked peculiarities and interesting points, which might be expected from their geographical position between the great Malayan Islands and New Guinea, ethnologically so distinct.

The island is of an irregular horse-shoe shape, about eight miles in diameter, irregularly and highly mountainous, having a lofty truncated peak at the northern end, which is constantly smoking, and on its eastern side the upper third shows bare and stratified layers of lava, with here and there large patches of sulphur; below which is dense forest, which also, as far as I saw, seemed to cover the whole island, resembling much the Molucca Islands in the profuse vegetation.

On the east side is a natural harbour, "Koelewette," where the ship anchored, deep water being obtained close up to the shore, with a muddy bottom; the margin being fringed with coral reefs going steeply down, from 6 fathoms. A very delicate *madrepora*, like *capillaris*, was obtained in quantities, together with many others in 2 to 4 fathoms. At the head

of the bay was an extensive mud-topped reef, on which were a few unhealthy corals, chiefly *goniastræa* and *tubipora*, the shore line being fringed with mangroves. The largest village on this side was situated here surrounded by a cocoanut plantation. In it there were about fifty houses or dwellings, enclosed by a dry-stone wall, having a wooden ladder for means of entrance and exit; a curious carved wooden figure raised high up on a post was found at the back.

By this village, which was called Solla, was a fine clear stream, and on either side of it were sago plantations, the water being used to wash the sago, in machines which were like those found in Ceram, and figured in "The Malay Archipelago"; these were numerous, and met with all over the island, the heaps of refuse, however, have a strongly offensive odour. Many bread-fruit, jack-fruit, mango, and cotton trees, bananas, and pineapples, with cocoanut, betel nut, ratan, and other palms were plentifully seen close by, the forest round was very dense with great numbers of acacias and Ficus spp., and very thick undergrowth, making travelling through it most difficult, and impossible without a native guide; near the mouth of the stream was a boat-building shed, and, from the amount of chips and *débris* round, they must do a good deal of work; some distance up nature was charming; the cool clear water ran quickly over its rough bed of boulders of hard basic lava rocks, in small rapids, the high and steep banks on either side being more or less covered by splendid ferns, and here and there a bright scarlet-coloured *hibiscus* flower showed, all overhung by great forest trees, bearing their burden of creepers and epiphytic plants, which shaded the hot glare of the tropical sun; in the clear air, numbers of small swifts sailing above, or a bright-coloured kingfisher darting by below, made a most delightful scene, and often near to, the deep "booing" of the great fruit pigeon, *Carpophaga concinna*, Wall., or a very closely-allied species; or a flight of lories, screaming loudly as they went by, would be heard.

In the pools were many large prawns, and I was much interested in seeing a bright-eyed native boy catching them; breaking off a small palm leaf, he made out of the mid-rib a couple of supple wands, each terminating in a noose. In one he placed a small piece of meat as a bait, with which the creature was lured from its hiding-place under the rocks, the second noose was then dexterously passed over its tail, and both quickly drawn out; I tried for a long time, but was never quite successful.

The first three days after our arrival, in company with Lieutenant Parry and a marine, I made an expedition round the side of the mountain to collect birds, etc., and if possible, to get

up to the top. The rock at the base was a trachyitic lava, and in places where there were any streams and springs, they were found to be quite hot, too hot to bear one's hand in for a moment. Many were at the shore line, but some being between tide marks; in one, cuttlefish and birds were cooked sufficiently for the natives to eat. After marching nearly all day through forest, more or less dense, we came upon a village, about one-third of the way up the mountain, where we camped; it much resembled the one at the head of the bay, being walled all round, and having a plantation at the back, of cocoanut, betel nut, and bread-fruit trees. The huts were built of bamboo, *not on piles*, the walls covered in with laths, generally quite down to the ground, having a gable roof of thatch. Inside, each had a shelf, or floor at the level of the springing of the roof of split bamboo, on which they slept, there being no furniture of any sort. Over the doorway were carved grotesque figures of men and animals; the huts were arranged more or less regularly in rows, all being nearly equal in size; inside the compound were mango, jack-fruit and bread-fruit trees, with many bananas. We soon created friendly relations, and a system of barter for eggs, fruit, etc., but they did not value money much; clothes, especially bright-coloured ones, being most coveted, as well as needles, pins, knives, matches, etc. They gave us a new but roofless hut to use, in which was a carved wooden bowl on a pedestal, over which was stretched tightly a deer skin; this drum they beat at sunrise and sunset. Outside was another carved post and figure [Plate VIII] 7 feet high, which I afterwards sketched, but as they strongly objected to my doing so, I had to finish it when most of the men were away in the daytime. In the middle of the night it poured with rain, and we were agreeably surprised when our next door neighbour came out, and invited us into his house, where we slept on the shelf among his numerous naked children, heartily glad of the shelter.

During our stay at this village they treated us quite as friends, and though rather inquisitive, were never troublesome, coming in and crowding round when we dressed, ate, or did anything; but although we left our belongings at other times unprotected, they never touched or stole anything in our absence. They made us understand that it would take more time than we could spare to get up to the top of the volcano, so I had to be content with shooting, etc., what I could in the vicinity; the density of the forest growth, and the want of paths making this a matter of great difficulty; the weather, too, was oppressively hot in the thick jungle.

Natives.—As far as I was able to make out there were two more or less distinct types. The first with dark brown skins,

coarse black hair, either straight, or with a tendency to curl, sometimes closely cut, roundish faces and heads, dark eyes, high cheekbones, nose much sunken at the base, nostrils dilated, mouth rather large, and lips much misshapen by betel-chewing, the bolus of which they kept half protruding in a disgusting way; body with but little hair, occasionally a short wiry beard and whiskers, height about 5 feet 6 inches, limbs well formed, ankles and wrists not particularly small, expression quiet and rather dull.

The second a coppery brown, much lighter race, with strong frizzly hair, either cut short, or standing out in a mop, coloured a rich orange yellow with lime, and evidently a great source of pride to them, face oval, eyes dark, sparkling, and full of life, nose aquiline, often slightly hooked at the tip, nostrils wide, mouth small, lips well cut, no hair on the face, at least, not when young adults, teeth good, expression bright and intelligent, limbs well shaped, rather delicate wrists and ankles, average height 5 feet 5 inches, or under; some of these were so graceful and handsome as to fill anyone who observed them with admiration; it was not a single individual, but numbers of them, and one instinctively made friends with their bright faces and ways. I was myself quite charmed. The former we found mostly in the coast villages, the latter on the hill side. In the former the low nose, straightish hair, thick lips, round heads, and high cheekbones, with general dulness of expression, point to Malayan origin, though the presence of curling in the hair, in some, and strong wiry beard, showed probable mixture of blood. In the second type the light colour, hairless faces and short stature are unusual in Papuans, yet the strong frizzly mop of hair, handsome faces, aquiline and slightly hooked nose, and general brightness of disposition very strongly favour that origin. Probably they are of a very mixed race, the inhabitants of Ceram and Bouru having spread south and intermingled with true Papuans from the east and Malays from the west.

The women were shorter in stature, with their hair done up in a knot at the back of the head: when young they were pleasant to look at, but apparently soon aged, and with their very pendent breasts were ugly: as a rule they did not leave the houses much while the men were in the compound or enclosure.

The average measurements of the hillmen I obtained were:

Height.	Length of head.	Width.	Cephalic Index.	Length of arm.	Length of leg.
5 ft. 5 ins.	$7\frac{4}{16}$ ins.	$6\frac{1}{16}$ ins.	82	32 ins.	35 ins.

Language.—The following words I collected from the hill or Papuan people:—

1. *Sarrah.*	9. *Worsi.*
2. *Wooruh.*	10. *Woosarrah.*
3. *Wortel.*	11. *Woosarrah missa.*
4. *Worwart.*	12. *Woosarrah wooruh.*
5. *Woolim.*	20. *Woo worruh.*
6. *Wornam.*	30. *Woo wortel.*
7. *Worit.*	31. *Woowortel missa.*
8. *Wortu.*	40. *Woo wor wart.*

Man, *oomo;* woman, *hatu;* fire, *ai;* water, *manu.*

I obtained these from one who also spoke Malay. The "*ai*," for "fire," might be an abbreviation of "*api*," but the word for "wood" in the Ké Islands is "*ai*," and with the N.W. Australians, wood and fire are both expressed by the same word, the numerals, however, bear a striking resemblance to those of the Timor Laut people.

Weapons.—Bows and arrows were their principal arms, every man being usually provided with them. The bows were made of bamboo, taken from a large stem, and nearly flat, the string being of twisted hide (deer), the arrows were about 5 feet 6 inches long, the shaft being of light bamboo, *not* feathered, the extremity of dark wood, very hard, 1 foot long, secured into the bamboo by fibre: these are more or less barbed. There were also some with iron heads, which are, I believe, only used when fighting amongst themselves; for shooting fish, at which they are most expert, they use long arrows with three points, each strongly barbed. They had some spears with wide flat iron heads, or all wood with the extremity barbed; for cutting cocoanut and jungle they have small parangs or knives, probably brought by Malay traders. These were the only weapons I saw.

Ornaments and Dress.—Through their orange-coloured bushy hair the men often wore combs most ingeniously made out of bamboo, and highly ornamented with carving, beads, tufts of hair, etc., and from their ears, the lobe of which was often much elongated, hung pendants of either silver, tortoiseshell, black wood, or fish bone; around their wrists they had wood or bone bracelets, more or less ornamented: these were much too small for any European adult, the wooden ones were of a curious shape, and studded with little brass nails (see Plate IX, Fig. 3). They did not pierce the nose or, I think, file the teeth, neither were any tattoo marks or scars seen on the body.

For dress, the men wore a simple T-shaped waist cloth, the women a short petticoat, and the children generally nothing.

Customs.—The men chiefly hunt and fish, or are employed boat-building, making sago, etc., and are away from the village all the day, when the women and numbers of children seem to

swarm out; besides their household duties the women and boys collect fruit from the forest and plantations, and bring in water which they carry in joints of large bamboos.

The beating of the drum at sunrise and sunset was no doubt a religious rite, as the chief man of the village did it each time, beginning gently, and working up to a loud pitch; in the evening several natives used to come and beat a few notes quietly; they were very careful to cover it up, and did not like us to put our things on it; the wooden "*gods*" were typically Papuan, and were held in fear. I also noticed outside the first-mentioned village an ordinary shed-like structure, under which was slung a small canoe, in which was seated the figure of a man: this was probably the grave of a chief.

One evening we persuaded the men to dance by moonlight inside the compound; two pairs accordingly began, linked arm in arm facing each other, advancing and retiring, singing and stamping: they were soon joined by others, until there were at least fourteen in two rows, their arms round the neck or waist of the next man. At first it was a slow measure, stamping and singing to a sort of chaunt, in perfect unison, but to a time which was most difficult for a European to pick up, this, after a time quickened, when they stamped up much dust; there being a sort of recitative, and two choruses ending by "kāki" and "sāli," which they uttered with the full force of their lungs, making the echoes ring again during the height of the dance. Most of the men and women turned out, and seemed very pleased when we applauded, they kept the dance going for two hours, but it became rather monotonous towards the end.

Their boats were generally "dug outs," with large outriggers, and had frequently a high and pointed bow and stern. Each also carried a forked stick amidships, like a mast, on which they suspended things, probably to keep them dry; the paddles were short, oval in shape, and with a cross-piece at the handle.

Salt was obtained by evaporating sea-water by the heat of the sun in shallow trays made of palm leaves.

The chief diseases I saw were ulcers of legs, mild cases of ophthalmia, one compound fracture of the arm which had been badly set, or not set at all, and a large number of men and boys more or less covered with the scaly ringworm of these eastern islands (*Tinea circinata tropica*). Pustular eruptions in the children were also very common. Thus it will be seen from the above that their mode of life and customs are decidedly Papuan, especially as regards their weapons, ornaments, houses, gods, and carvings; but bearing in many respects a strong resemblance to those of the people of Tenimber, as described by Mr. H. O. Forbes, in "Naturalist's Wanderings in the Eastern Archipelago;"

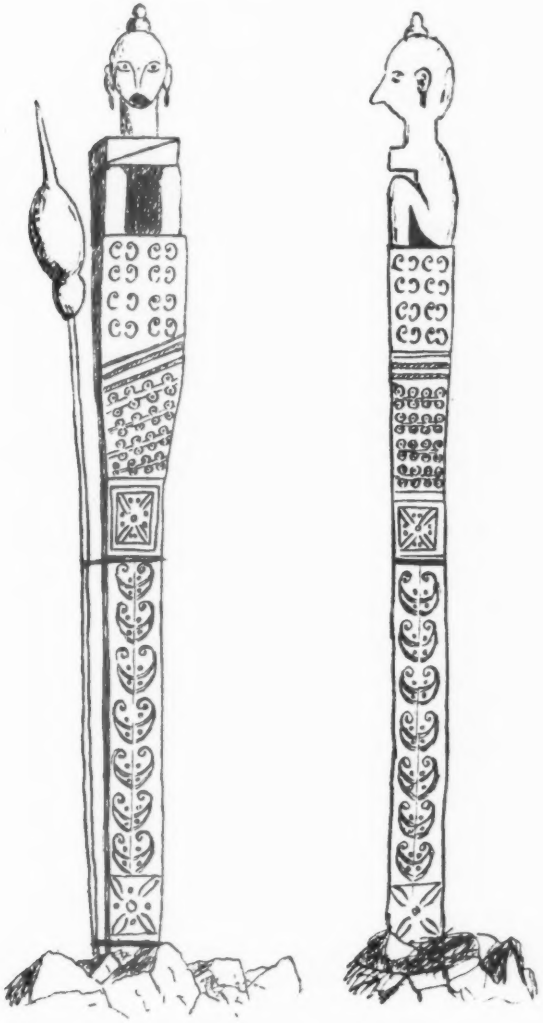
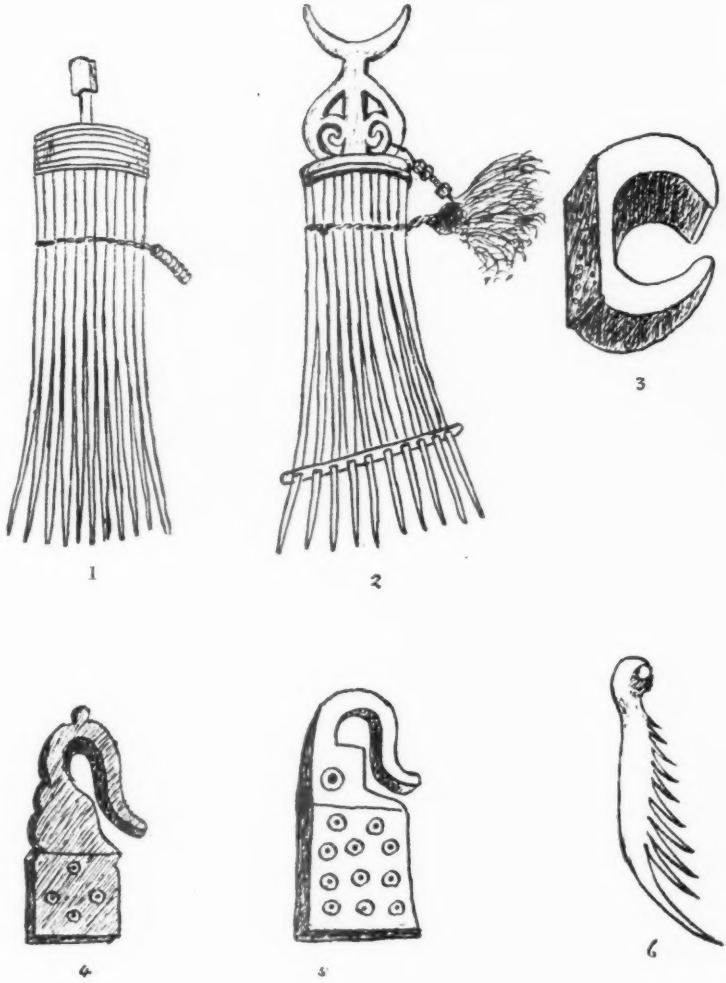


FIGURE OUTSIDE HILL VILLAGE.



1, 2.—BAMBOO COMBS. 3.—WOOD BRACELET. 4, 5, 6.—EAR PENDANTS.

thus physically and generally one may fairly consider that the majority belong to the "Melanesian," rather than the Malay, race.

The contrast to us of these pleasant-faced people, after the ugly natives of North West Australia, whom we had just left, and the Malays of Amboyna, shortly afterwards encountered, was striking.

The only quadruped obtained was a *cuscus*, but many large lizards were seen, and deer and pig are present. Eleven species of birds were collected, and many crustacea, etc. Mr. J. J. Walker, F.L.S., also obtained a valuable entomological collection.

On the TASMANIANS *as Representatives of* PALÆOLITHIC MAN.

By EDWARD B. TYLOR, Esq., D.C.L., F.R.S.

[WITH PLATES X, XI.]

[Read March 21st, 1893.]

IN the accounts of early visits to Tasmania, we have little more than mentions of the chief uses to which the natives put their stone implements. Tasman, on the first discovery in 1642, without seeing any of the people, judged that the notches for climbing the great trees were cut with flints. In 1772, Marion du Fresne saw natives armed with pointed staves, and with stones which appeared to have cutting edges like axe-heads. Furneaux supposed the spears to be sharpened with a shell or stone, and later, Widowson states that they harden one end, which is very sharply pointed, by burning and filing it with a flint prepared for the purpose.[1] These remarks, however, do not show how the native stone implements of Tasmania differed from those of Australia and Polynesia. About 1860 a Tasmanian stone implement was brought to England by Mr. Thomas Dawson, who presented it to the Museum of the Somerset Archæological Society at Taunton. As appears from the cast exhibited (see Plate X, Fig. 1, *a*, *b*, *c*), it is formed from a flaked-off fragment, dressed by chipping to a rough surface before being struck off the block, and then finished by a series of blows struck round the inner surface so as to remove a succession of small chips

[1] Swart, "Journaal van de Reis naar het onbekende Zuidland door Abel Jansz. Tasman," Amst., 1860, p. 71 ("met vuersteenen gehouwen"). Crozet, "Nouveau Voyage," Paris, 1783, p. 28 ("armés . . . . de quelques pierres qui nous parurent tranchantes, semblables à des fers de haches.") Furneaux in Cook, "Second Voyage," vol. i, p. 113. Widowson, "Present State of Van Diemen's Land," London, 1829, p. 190.

from the outer, leaving a cutting edge. The sight of this instrument led me to make enquiry at the International Exhibition of 1862 in London, from Dr. Milligan, Commissioner for Tasmania, the best authority on the language and habits of the natives. From him I learnt that the Tasmanian women carried a quoit-like stone, 4 to 6 inches across, chipped about two-thirds round the edge, for notch-climbing trees; women would carry good ones. From these and other particulars obtained at the same time, I wrote as follows in 1865 in "Early History of Mankind," arguing that comparison of Drift implements with those found elsewhere breaks down any imaginary line of severance between the men of the Drift and the rest of the human species. "The Tasmanians sometimes used for cutting or notching wood a very rude instrument. Eye-witnesses describe how they would pick up a suitable flat stone, knock off chips from one side, partly or all round the edge, and use it without more ado; and there is a specimen corresponding exactly to this description in the Taunton Museum. An implement found in the Drift near Clermont would seem to be much like this."[1] These details are here given at length, as apparently the earliest mentions of a subject materially affecting the history of the Stone Age, namely, the persistence among these modern savages of a state of stone implement making comparable to that of mankind in their remotest acknowledged antiquity.

It appears from the records that Dr. Milligan after his return presented to the Royal Society of Tasmania specimens of native stone implements, now in their Museum at Hobart Town, and in 1873 a thorough examination of the manufacture and use of these rude tools and weapons by the aborigines was made by several capable observers in the Colony. When Mr. Brough Smyth, in preparing his great work on the aborigines of Victoria, was desirous of bringing the stone implements of Tasmania into comparison with those of Australia, a number of specimens were sent over to him, which he carefully described and figured. Questions arising, the whole subject was discussed at the Royal Society of Tasmania by Dr. Agnew, Mr. Ronald Gunn, Mr. Kane, Mr. James Scott, and others, with the best available information, the results of the conference being carefully set down.[2] Through this examination, the evidence of competent colonial eye-witnesses as to the native manner of making and using the implements was collected. Though information on the subject thus approached conclusiveness, the want of specimens in England

[1] Tylor, "Early History of Mankind," London, 1865, p. 195.

[2] "Papers and Proceedings of the Royal Society of Tasmania," 1873. R. Brough Smyth, "The Aborigines of Victoria," Melbourne and London, 1878, vol. ii, p. 401. H. Ling Roth, "Aborigines of Tasmania," p. 155.

made it difficult for anthropologists here to study fully the important problems raised by the stone implements of Tasmania. In 1890 I contributed a preface to Mr. Roth's work, bringing forward the Tasmanians as giving an idea of the conditions of the earliest prehistoric tribes of the Old World, at a somewhat less advanced stage of stone implement making than were the men of the Mammoth Period in Europe. Even then the Taunton specimen was the only one available.[1] At present, however, this difficulty is in great measure removed. At my request, it was brought under the notice of the Royal Society of Tasmania in 1890 by the Governor of the Colony, Sir R. G. C. Hamilton, and a number of selected specimens were sent over by the Curator of the Museum at Hobart, Mr. Alexander Morton. I have also, through the help of Mr. W. L. Williamson, of Brown's River, obtained a general collection of finished implements, wasters, and chips, much as they occur on the ground, in all about 150. These, with a small set of well-chosen examples in the hands of Mr. H. Balfour, Curator of the Pitt Rivers Museum, give fair means of judging the general characteristics. By examination of the specimens exhibited, in connection with the published information, I propose to state briefly the main points as to their material, make and use, with the view of using the position of the Tasmanians in the Stone Age as a standard for comparison with their position in general culture.

The present collection, which Professor A. H. Green, F.R.S., has been good enough to examine mineralogically, seems to include specimens of most or all of the materials described by Mr. R. M. Johnston in his Geology of Tasmania, and by Mr. R. Brough Smyth and Mr. Cosmo Newbery. The two kinds of rock principally used are characteristic. One is described by Prof. Green as an argillaceous rock, bedded but not finely laminated, for which the convenient term "mudstone" has been used; it has undergone some degree of induration, such as might be produced by contact with igneous rock. Mr. Johnston, who it should be noticed was also struck by the palæolithic character of the native implements, mentions that an altered mudstone from which they were made may be seen *in situ*, partly overlaid by greenstone, at Hunter's Mill, opposite Native Point, near Perth.[2]

[1] In 1873, Mr. Morton Allport sent over six Tasmanian stone implements with an instructive letter, published in the "Journal of the Anthropological Institute," vol. iii, p. 178, but unfortunately it is not known where these specimens are.

[2] R. M. Johnston, "Systematic Account of the Geology of Tasmania." Hobart, 1888, p. 334. Mr. Johnston remarks that the rudely chipped flints of the Tasmanians are of the simplest character, rarely symmetrical, and more like the earliest Palæolithic flint implements of Europe, especially those figured in the

In examining the present collection, it seems difficult to account for a comparatively soft mudstone being so much used for implements (Plate X, Figs. 3, 6; Plate XI, Figs. 8, 10) when far better material was available in the country. Especially the second kind of rock, of which a still larger number of specimens consist (Plate X, Figs. 2, 4, 5, Plate XI, Figs. 7, 11), is altogether superior in consistency and fracture, in fact comparing with good chert and flint in taking and retaining an edge. This is a pale grey close-grained stone in which fragments of quartz are visible to the naked eye; the microscope shows it to be a compressed and re-cemented grit, probably derived from the denudation of quartz felsite. Other materials, especially quartzite, are represented in the present collection, but specimens of them are few in comparison with those of mudstone and grit. The collection of implements now exhibited apparently agrees as to material with those studied at the Royal Society of Tasmania, where mention is made of two different kinds of stone, the one apparently an indurated clay rock, the other containing a large proportion of silex. It must be borne in mind that the word "flint" is used by writers in a loose popular way, meaning indeed no more than a sharp stone.

The conclusion recorded by the Royal Society of Tasmania as to the make of the implements is that no true tomahawks (*i.e.*, stone hatchets with handles) were known to or fabricated by the natives. They merely used sharp-edged stones as knives. These were made sharp, not by grinding or polishing, but by striking off flakes by another stone till the required edge was obtained. As a very general, if not invariable rule, one surface only was chipped in the process of sharpening. These statements are in general accordance with the observations of Mr. Brough Smyth and Mr. R. M. Johnston, and with the specimens now exhibited, but certain qualifications and explanations are needed, and further particulars have to be added.

Although some specimens are seen to be trimmed by rather fine chipping (as Plate X, Fig. 4, Plate XI, Fig. 9), there is no record of the small chips ever being flaked off by pressure, but only by blows with a stone. It is probable that this was the only method used, as when Mr. James Scott mentions seeing natives sitting for an hour at a time, chipping one flint with another, so as to give them the peculiar cutting

Memoir of M. Ribeiro at the International Congress of Prehistoric Anthropology and Archæology, Brussels Meeting, 1872. To judge from the not very distinct illustrations to this paper, the similarity is more or less real, but M. Ribeiro's specimens from Portugal are claimed as of Miocene and Pliocene origin, and in the present unsatisfactory state of the discussion on alleged Tertiary stone implements, I refrain here from any special comparison of the Tasmanian implements with them.

sharp edges. Sharp fragments merely struck off the block of stone are common; often these appear to be wasters, but such sharp-edged flakes (Plate XI, Fig. 11) being suitable for many purposes, were certainly used without further trimming. The edge-chipping of one surface only is clearly seen in the specimens (Plate X, Figs. 1, 5, Plate XI, Fig. 7) and Mr. Brough Smyth's remark is doubtless correct that this was done by holding the fragment in the palm of one hand with the edge outwards, and with a piece of stone in the other hand giving blows towards the palm and away from the edge. It should be added that the smooth inner surface detached from the core or block was turned upwards to receive the blows on its margin in this simplest and easiest process of edge chipping, as the specimens figured show. For bringing the implement into convenient shape, however, it is evident that chips might be removed not only from the outer surface, but sometimes from the inner. Certain wavy striations which appear in some of the figures (especially Plate XI, Figs. 7, 11) are natural, being due to the tearing of the stone. No implement of native manufacture shows any trace of having been ground or polished. There is nothing against the general agreement that this was never done, except Mr. Thirkell's letter describing the "sharp flint stone" used in notching trees for climbing, as having "the edge ground as sharp as they could against another stone." But the notching-stones (as in Plate X), being always edged by chipping, Dr. Agnew is probably right in suggesting that the writer only meant this.

There are statements of experienced observers that the implements were grasped in the hand for use, never mounted on handles. The information of Mr. Thomas Scott, Assistant Surveyor-General, who was in the Colony from 1820, is that he never learnt that the aborigines used the flint implements as tomahawks, but invariably held them in their hands with the thumb resting on the flat surface, and turning the stone as found convenient to get the cutting edges where required. Mr. Ronald Gunn, F.R.S., states that "those resembling tomahawks were held in the hand, and under no circumstances, so far as I know or can learn, were they ever fixed in any handle." The present specimens and all others known to me by description agree with these opinions. Care seems to have been taken so to shape them that they might rest conveniently in the hand for use. This is noticeable in the prevailing type of notching-stones and also in the stone knives with back and edge (Plate X, Fig. 4).

However, some other statements have to be taken into consideration. Dr. Agnew was told by some correspondents that in addition to the implements described, the natives made use

of others after the manner of axes, that is, they fastened to them handles in the shape of withes, bound round with the tendons of some animal. One of these letters is from Mr. James Rollings, who in his youth (1840 ?) had mixed with the natives and had many opportunities of seeing how they used their stone knives and tomahawks. After describing the ordinary implements grasped in the hand, he continues: "A larger stone, well selected, about four or five pounds in weight, was used for a tomahawk, a handle being fastened to it in the same way as a blacksmith fastens a rod to chisels, &c., for cutting or punching iron, being afterwards well secured by the sinews of some animal. The handles were strong saplings of wattle or curry-jong. These were the only stone implements he saw used among the natives, and very expert they were in using them." Dr. Agnew gives the general opinion of those who have examined the subject, when he says: "Other observers think our aborigines did not originally use these handles, but learned how to attach them from some New South Wales aborigines who came to this country in the early days of its settlement." To me this seems the most probable explanation. Such intercourse with Australian natives certainly took place, and may have introduced the Australian stone hatchet, but had anything like this been previously in the hands of the Tasmanians, we should expect to find specimens not merely of chipped stones, suited for hand grasping, but also of hatchet-blades made for fixing in a handle, and even polished after the native Australian manner. None such, however, have as yet appeared. It may be noticed that the statement as to stone hatchet-blades of the great weight of four or five pounds does not agree with the ordinary size of such implements either in Australia or Tasmania.

The question which suggests itself on first inspection of this collection of Tasmanian implements, is how with such poor tools even the rude native crafts could be carried on. It must be noticed, however, that they are for practical purposes somewhat better than they look, being indeed made with great care and skill in getting the edges straight and the grip firm. Fortunately also there are a few passages which show how they were actually used. It seems wonderful that with one of the disc-shaped notching-stones the natives should so quickly have made the notches for climbing the gum-trees, till we notice Mr. Thirkell's remark that they would "chip the bark downwards and make a notch for the big toe," which shows that they did not hack out a piece of the bark, but merely split it in the direction of the fibre, forcing the cut open with the toe till it could rest there. The following remark by Mr. Rollings shows how cutting was done.

"The knives when used for skinning kangaroos, &c., were held by the fore-finger and thumb, and the arm, being extended, was drawn rapidly toward the body. The carcase was afterwards cut up, and the knife was held in the same way. In cutting their hair, one stone was held under the hair, another stone being used above, and by this means the hair was cut, or rather, by repeated nickings, came off."[1]

From the foregoing evidence it appears that the Tasmanians, up to the time of the British colonization in the present century, habitually used stone implements shaped and edged by chipping, not ground or polished. These belong, notwithstanding their modern date, to the order of the very ancient "palæolithic" implements of the Drift and Cave Periods, from which the later implements of the "neolithic" order are distinguished by greater variety of form and skill of finish, and especially by the presence of grinding or polishing. The comparison of the Tasmanian stone implements with those of the ancient world impresses on us the fact that the rude modern savage was content to use a few forms of implement for all purposes of cutting, chopping, &c., these being flakes as struck off the stone, and such flakes or even chance fragments trimmed and brought to a cutting edge by striking off chips along the edge of one surface only, whether completely or partly round. Such tools are known to the Stone Age of the Old World. Mere chips of flint, &c., no doubt always served for much of the cutting and scraping which they were at least as well adapted to as more artificially made flakes would have been. The special though simple "scraper" edged by chipping from one surface, more or less closely corresponding both in shape and mode of making with the Tasmanian, belongs to the palæolithic period, where it is especially characteristic of the cave deposits of Le Moustier in Dordogne, while similar though usually neater examples continue to be found in the neolithic period. The Tasmanian, though using types of implement not unfamiliar to palæolithic man, is not known to have attained to making any implement approaching the characteristic palæolithic pick chipped into symmetrical form, and edged and pointed by chips taken in order from both surfaces. If it may be taken that the information from Tasmania is conclusive in this respect, it will appear that the savages there, within this century so miserably erased from the catalogue of the human race, were representatives of stone age development, a stage lower than that of the Quaternary period. Even should specimens of higher order be found in Tasmania, they will leave untouched the conclusion now established by abundant evidence, that during the present century the natives habitually made and

[1] Roth, pp. 17, 157.

used for the ordinary purposes of life stone implements of a low palæolithic kind.

The apparent ignorance of the Tasmanians of the art of fixing a stone implement in a handle, unless where natives of Australia had introduced among them their own mode of fitting, raises an interesting question as to hafting among the palæolithic men of Europe. Of the stone implements of the Drift and Caves, many are evidently made from stones chosen to fit the hand, or shaped with a view to grasping, while no certain evidence proves them to have been ever fixed in the wooden handles so certainly familiar in neolithic times. It is apt to be assumed that the Drift flint picks were stuck into clubs, bound in withes, or otherwise hafted, but this opinion seems generally due to an unwillingness to conceive even of most ancient savages as wanting the ingenuity to realize the advantage of an axe-handle. The force of this assumption is, however, lessened by the descriptions of the modern Tasmanians as not conscious of this want, but being content to grasp their rudely chipped cutting stones in their hands. It being indubitable that hand-grasped stone implements were used by these rude modern people for purposes for which, had they known of handles, they could easily and would certainly have had recourse to them, it results that we have no right to assume the wooden haft to have belonged to the earliest Stone Age, but are obliged to allow that it may have been invented at a later period of industrial development.

Of degeneration in culture as accounting for the low state of implement-making in Tasmania, there is at present no evidence, nor is it easy to imagine their rude tools as the successors of higher ancestral forms. Had they had even the hatchet of their Australian neighbours, sharpened by rubbing its edge on a grit-stone, and bound into a withe or cemented to a stick, it is hardly conceivable that they should have abandoned such a tool for a rudely-sharpened cutting stone gripped in the hand; they would have lost more time and pains in the first day than would have sufficed to replace the better implement. Such carelessness would not indeed agree with the careful and patient skill which they, like other savages, gave to finishing their rude implements to the most serviceable point, in which they would spend hours and even days, regardless of trouble. The well-known readiness with which they took to European tools, shows an appreciation of labour-saving which contrasts strongly with the idea that at any time, possessing ground stone hatchets with handles, they abandoned them for chipped stones grasped in the hand. It seems more likely to consider that in their remote corner of the globe they may have gone on little changed from early ages, so as to have remained to our day living

representatives of the early Stone Age, left behind in industrial development even by the ancient tribes of the Somme and the Ouse.

Such being the position of the Tasmanians as modern tribes in the lowest Stone Age, the study of their culture in other respects affords valuable though imperfect guidance to formation of opinion as to the earliest distinctly recognizable period of human civilization.

This will appear more clearly from the following brief summary of native Tasmanian life,[1] which presents a picture of man at perhaps the lowest intellectual and industrial level found among tribes leading an independent existence, on their own land and after their own manner. It will be observed that their ideas and habits conform in a general way to the characteristics of normal or healthy savagery elsewhere in the world. Their arts, language, religion, social rules, are on the usual lines of the lowest tribes of man, only at simple and rude stages. The point especially to be noticed is that, just as their stone implements belong to the recognized stone age, though at an especially low level, so it is with the rest of their culture, which is not of an abnormal but only of a low and rude type. They have throughout the characters of mankind in a somewhat more primitive condition than any other tribe among those sufficiently known for detailed comparison, in either ancient or modern times.

Though living mainly by the chase, the Tasmanians knew nothing of the bow and arrow, nor of the spear-thrower characteristic of Australia. Their spear was a stick 16 or 18 feet long, scraped with their stone tools, and usually only pointed by the aid of fire, though there is once a mention of a point of human bone fixed on; though crooked and apparently clumsy, these were bent with the teeth so as to balance truly and were skilfully thrown. They had a wooden club or waddy with a roughened grip, for striking and hurling, and they seem to have used stones, apparently their ordinary choppers, in fight, and a flat wooden shield. They had not the Australian bark canoe, but a canoe-shaped solid float of bundles of bark on which they sat or stood, paddling or punting with a pole. They were string, net, and basket-makers; made fire with the simple fire-drill, and roasted their fish and game; put up such rude shelters of boughs as met the needs of their life of wandering in quest of food. Intellectually they showed no mean power when the inducement sufficed; in hunting and tracking their skill was a wonder to the white men, and in war the patient cunning of

[1] The authorities for this sketch may be conveniently consulted in Mr. Ling Roth's invaluable monograph on "The Tasmanians."

their pursuit and ambush made them, in spite of their miserable weapons, a terror. They drew pictures on bark, &c., which seem from descriptions to have shown ordinary savage skill; one copied by Bonwick might have been done by native Americans. In no respect is superiority of the European cave-men to them more striking than in their drawing and carving, which the Tasmanians had no pretension to rival.

The following remarks fairly sum up their mental position: "Their intellectual character is low; yet not so inferior as often described. They appeared stupid, when addressed on subjects which had no relation to their mode of life; but they were quick and cunning within their own sphere." Morally, the descriptions of their character present the usual contrasts of savage life; the mother would rush through the fire to save her child, the son would abandon his sick or aged parent under a ledge of rock or in a hollow tree. On the one hand we read of their peaceful and inoffensive kindness, on the other hand of their treachery and relentless cruelty. One colonist never finds it necessary to carry fire-arms to protect himself, while another after carrying his gun for days, lays it down for a moment, and instantly from behind a tree the spear of an unseen black reaches him, one of a party who break out of their hiding places to set fire to the house and kill the women and children. But this contrast of behaviour, under different conditions, only illustrates in an extreme form the law which guides ourselves in our different conduct toward friend and enemy. Perhaps no people ever had more rudimentary rules of law and government than these savages, with no property in land, but waging war to the death against the trespasser in pursuit of game; with hardly any government over the wandering clan except the undefined authority of "the bully of the tribe," and yet as soon as war broke out following with absolute obedience the chosen war chief.

Taken as a whole, this may be the rudest picture known of the condition of a savage people leading a healthy normal life, getting their living from nature. It has no small importance in the light it throws on the problem of civilization. A people isolated from interference from without, and in harmony within with their "milieu environnant," to use the term of Lamarck, so that circumstances to no great extent compel improvement or bring on decay, may, it seems, remain comparatively unchanged in their level of culture, even from remote prehistoric ages, just as mollusca of species first appearing far back in the earlier formations may continue to live and thrive in modern seas.

Of the Tasmanian language, the details which have come down, incomplete as they are, are sufficient to show an agglu-

tinating language of simple structure, but not extraordinary lowness. The root-forms can be to a certain extent separated from suffixes, such as *na* (singular), as *pugga-na*=man, *lowa-na*=woman; the suffix disappears in combination, as in *lowa-timy*=bachelor (woman-without). Reduplication forms plurals, intensives, &c.; as *nubra-na*=eye, *nubru-nubere*=eyes. Compound words suffer contraction, thus *panubere*=sun, appears beside the fuller form *pallanubrana*, which seems made up of *palla-nubra-na*, that is, (black)man's eye. Imitative words, though not unknown, seem by no means common. On the whole, the Tasmanian is quite remote from anything like an origin of language.

The records of the religious ideas of the Tasmanians are full of interest from the present point of view. It is true that some misleading details have been given, through want of ability to distinguish native from imported beliefs, but these can be eliminated and genuine information confirmed by means of the native vocabularies. Thoroughly native beliefs, moreover, differ from anything that could have come from Europeans. Thus it was certainly not from the religion of the foreigners that the natives learnt their fundamental doctrine of the *warrawah* or shadow as being the human ghost, nor the action of such ghosts in curing diseases by expelling the demons causing them, nor the custom of wearing bones of dead friends to secure the protection of their spirits, who were the manes-deities to whom they looked for guidance and help in trouble. The native belief in a future state involved life in some distant region, and especially the foreigners were as elsewhere identified with dead Tasmanians returned from the spirit-land. If the spirits swarming in mountain and forest resembled the European elves and fairies, their genuineness in native belief is plainly proved by native names, as *nanginya*, an elf or hill fairy, and their name for the echo, *kukanna wurrawina*, that is, talking shadow. Their spiritual hierarchy included greater demons or deities, whom according to Milligan, the best judge in such a matter, they do not seem to have considered benevolent. For such beings there were native names, especially that written down as *rediarapa*, *rargeropper*, *raegoo wrapper*, who was said to cause thunder and lightning, and whose name the colonists adopted as a term for their own Devil. At this point, however, Christian ideas become mixed with native Tasmanian, and beliefs are asserted as to a good and evil spirit which have no confirmation in the vocabularies or in testimony of competent observers, and must be rejected as borrowed theology. But as a whole, the Tasmanian religion was a rude animism, based on the same fundamental principles as the religions of the lower races

elsewhere in the world, and even carried out in great measure in similar developments.

In conclusion, the effect of the present evidence may be stated as confirming and extending the argument, familiar on neolithic ground, that the condition of modern savages illustrates the condition of ancient stone age peoples, representatives of a stage of culture at once early in date and low in degree. The Tasmanian specimens and records now place us in full view of the state of a people in the palæolithic stage, who may have lasted on in their remote and unvisited home from the distant ages when rudely chipped stones grasped in the hand were still the best implements of mankind, to be only in future ages superseded by higher types with their sharp-ground edges and effective helves. The life of these savages proves to be of undeveloped type alike in arts and institutions, so much so that the distinction of being the lowest of normal tribes may be claimed for them. Still, though the difference between them and even their Australian neighbours is enough to mark lowness of stage, it by no means amounts to an immeasurable interval. Their palæolithic state does accompany a corresponding lowness of general condition, as compared with that of modern neolithic savages. But the passage from neolithic to palæolithic only carries us back a stage. The great initial developments of language, arts, religion, society, still remain in the remote background of human development.

MAY 9TH, 1893.

Professor A. MACALISTER, M.D., F.R.S., *President, in the Chair*; afterwards JOHN BEDDOE, Esq., M.D., F.R.S., *Vice-President.*

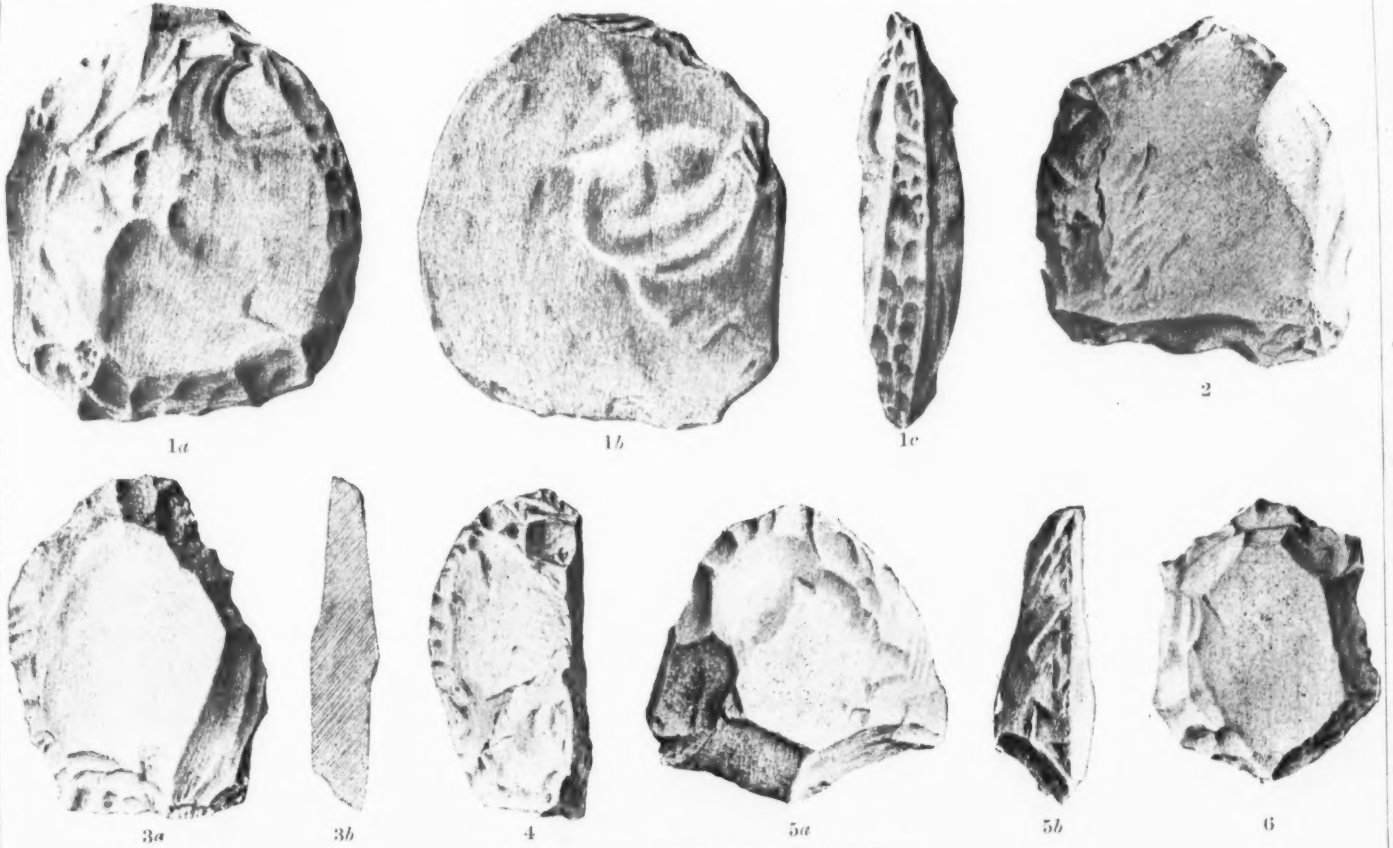
The Minutes of the last Meeting were read and signed.

The election of CHARLES GEORGE HALE, Esq., of Ivy Hatch, Sevenoaks, was announced.

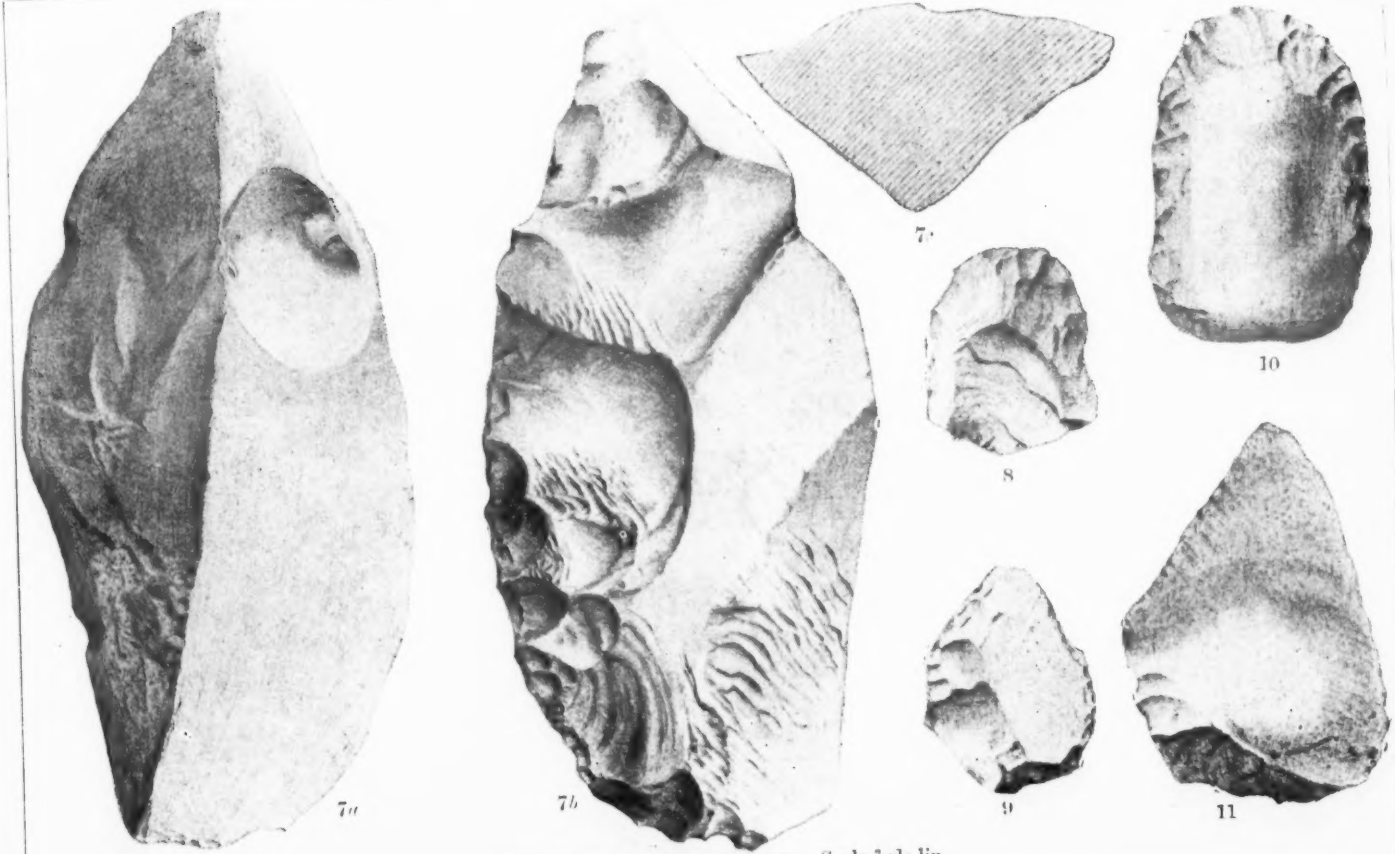
The presents that had been received were announced, and thanks voted to the respective donors.

Mr. C. DUDLEY COOPER exhibited the skull of an aboriginal Australian, upon which Dr. GARSON made some remarks.

A paper on Borneo, by Mr. C. HOSE, was read, and the author exhibited a large collection of objects of ethnological interest from that country.



TASMANIAN STONE IMPLEMENTS. Scale $\frac{2}{3}$rds lin.



TASMANIAN STONE IMPLEMENTS. Scale $\frac{3}{4}$rds lin.

Dr. Beddoe, Sir Hugh Low, Mr. Randall H. Pye, Mr. H. O. Forbes, Professor Haddon, Mr. C. H. Read, and Professor Thane took part in the discussion.

Professor Macalister exhibited a skull from North Borneo.

Mr. Rudler exhibited a wooden fire syringe from the Malay Peninsula with a brass tinder box.

A paper by Mr. R. G. Leefe on the "Natives of Tonga" was taken as read.

Notes *on the* Skull *of an* Aboriginal Australian.

By C. Dudley Cooper, M.R.C.S., *Assistant Medical Officer, Claybury Asylum.*

(Introduced by Professor G. D. Thane.)

[with plate xii.]

The skull shown was found as part of a complete skeleton at Williams Town, Victoria.

The first point of interest is the *cranial capacity*. In the estimation of this—shot, Garson's rammer, and a funnel of 12 mm. in diameter were used—six observations were made, three by Professor Thane and three by myself independently, and an average of 1,500 cc. resulted. That this is exceptional is shown by the fact that it is greater than any recorded by Sir William Flower[1] by 40 cc. The average cranial capacity given by Flower is 1298 cc. for thirty-two skulls examined. MM. de Quatrefages and Hamy[2] give an average of 1269 cc., and Sir William Turner[3] a still lower one of 1230 cc., based on an examination of thirty-four skulls. Turner, however, has recorded the skull of a male from Port Curtis, Queensland, whose cranial capacity was 1514 cc., and this is the only instance I can find of an aboriginal Australian skull having a larger cranial capacity than the one I am now showing.

The *external measurements* of the skull, taken with Flower's craniometer, are as follows:—

From the glabella to the occipital point ..	193 mm.
From the ophryon to the occipital point ..	192 mm.
Maximum breadth (interparietal)	142 mm.
Basio-bregmatic height	137 mm.

[1] Osteological Catalogue—Royal College of Surgeons. Part I, "Man," 1879.
[2] "Crania Ethnica," 1873–81.
[3] "Voyage of H.M.S. 'Challenger.'" Report on the Human Crania, vol. x.

These measurements give a *cephalic index* of 73·6 or 74, according to the length-measurement used (GlO or OphO): either of them is slightly above the average given by Flower.

The *index of height* is 71—Flower's average exactly.

The horizontal circumference of the skull, taken with a tape-measure over the ophryon and the occipital point is 533 mm.

On noticing the transverse arch of the cranium it is seen that the line of the sagittal suture is elevated, and the surface of the parietal bones somewhat flattened, so that if the skull be viewed from behind the pentagonal figure, which has been so often described in these Australian skulls, is rendered very distinct.

The degree of complication of the sutures corresponds to No. 3 of Broca's[1] scale, but a few of the dentations are somewhat longer than those of the scale.

The glabella corresponds to No. 4, and the inion to No. 1 of Broca's scale.

The Face.—The most striking characteristic of the face is the marked prominence of the jaws. If the basi-alveolar length of 110 mm. be compared with the basi-nasal length of 106 mm., an *alveolar or gnathic index* of 103·8 is obtained. (Prognathous.) This index is slightly above the average for Australians. Flower's average being 103·6 for fifty-one specimens examined, and the mean gnathic index in Turner's specimens was 100·3, making the average meso-gnathic. Two of his specimens, however, had the high gnathic indices of 108.

The mandibular angle is 120°.
The symphysial angle is 100°.

The measurements of the nose give a *nasal index* of 55·8. (Platyrhine.)

These measurements are:—

Nasal height	52 mm.
Nasal breadth	29 mm.
Nasion to nasal point	52 mm.
Nasal point to alveolar point	20 mm.

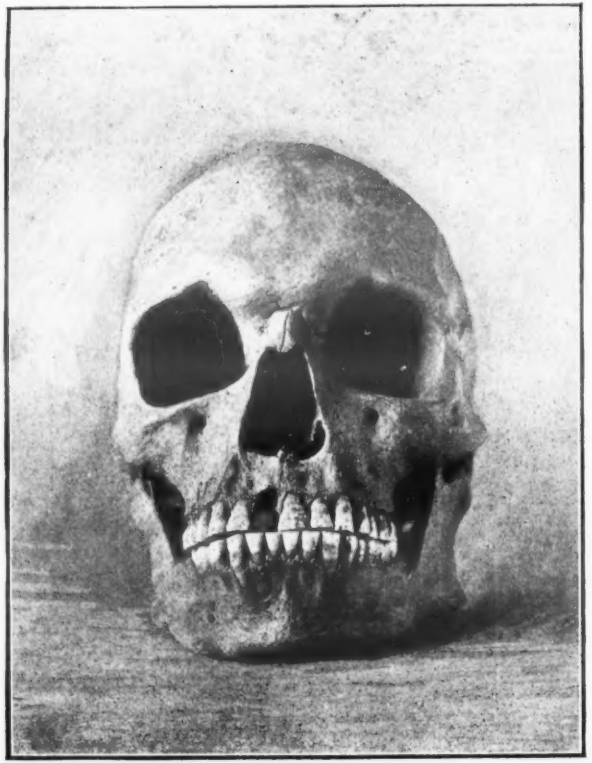
The orbital height (the right orbit being used for measurement) is 35 mm., and the breadth 40, giving the somewhat high *orbital index* of 87·5. This index would place the skull in the mesoseme group, whereas the majority of aboriginal Australians are microsemes.

Other facial measurements are:—

Naso-malar line	118 mm.
Bi-malar line	109 mm.,

so that the *naso-malar index* of Oldfield Thomas is 108·2.

[1] "Instructions Craniologiques et craniométriques," Paris, 1875.



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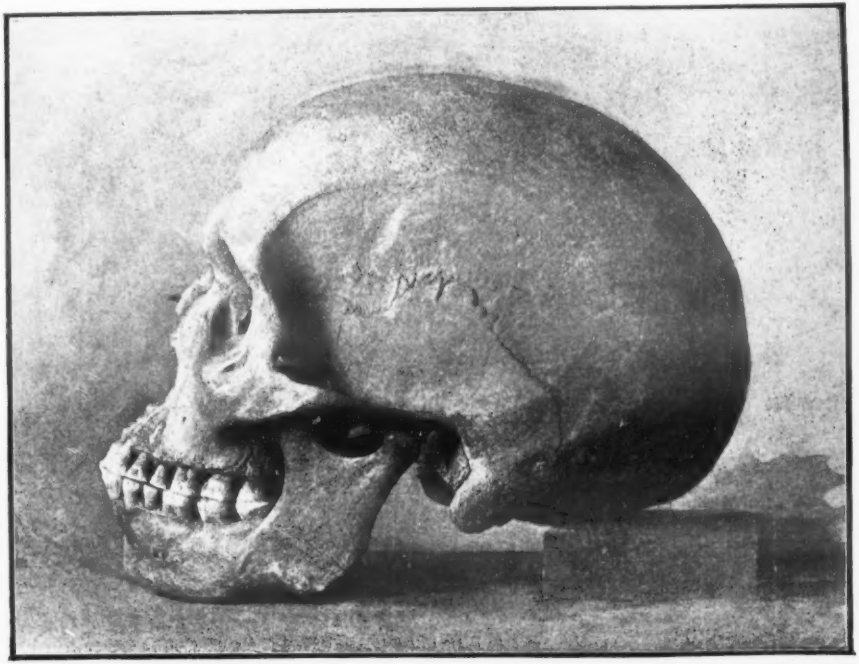

b

SKULL OF AN ABORIGINAL AUSTRALIAN.

The Palate.—Measurements :—

Palato-maxillary breadth	..	..	71 mm.
Palato-maxillary length	..	..	66 mm.,

giving a *palato-maxillary index* of 107·5.

The Teeth.—I have elsewhere[1] given a short description of the teeth of this skull, but I append one here for the sake of completeness. The teeth are in a very good state of preservation and are all present, with the exception of the right upper central incisor. This tooth was present during life, but was lost after the arrival of the skull in this country. The crowns of the teeth are very much ground down, more especially those of the molar and premolar series. Their degree of usure corresponds to No. 3 of Broca's scale. If the two jaws be articulated, it is seen that, in accordance with the observation of Sir Wm. Turner[2] on these skulls, the two sets of incisors are in contact by their free cutting edges.

That the crowns of the corresponding teeth of the upper and lower jaws in the majority of Australian skulls are not in the same vertical plane is well borne out by the specimen shown. In this skull the crown of the lower wisdom tooth projects somewhat behind the upper wisdom. The second molars are in almost a vertical plane, but the remaining teeth of the molar and premolar series of the lower jaw are situated slightly in front of the corresponding upper teeth.

The width of the upper dentary arcade, between the first molar teeth, is 67 mm.—the maximum of Sir Wm. Turner's measurements being 66 mm. The width taken between the second molars is 72 mm., being slightly below the 73 mm. maximum of Turner. Between the wisdom teeth the width of the arcade is 70 mm., Turner's maximum in the same situation being 75 mm.

The width of the lower dentary arcade, taken between the first molar teeth, is 61 mm.—Turner's maximum being 63 mm.—opposite the second molars the width is 66 mm. as compared with 69 mm. of Turner's, and between the two lower wisdoms the width is 70 mm., Turner's maximum for eleven skulls measured exceeding it by 2 mm.

The measurements show that the upper jaw exceeds the lower in width between the first molars by 6 mm., Turner's average excess in the same situation being 5 mm. Between the second molars the excess of the upper over the lower jaw is also 6 mm., higher than Turner's average measurement by 2 mm.

The antero-posterior measurement of the crowns of the molar

[1] "Proceedings of the Anatomical Society of Great Britain," May, 1892.
[2] "Journal of Anatomy and Physiology," July, 1891.

and premolar teeth is, in the upper jaw on the right side 51 mm., on the left, 49, giving an average of 50, very near Turner's maximum of 51 mm. In the lower jaw the measurements are on the right side, 53 mm., and on the left, 53 mm., Turner's maximum being 56 mm.

The excess of the lower antero-posterior measurement over the upper was 3 mm., exactly the same as Turner's average excess both for aboriginal Australians and Europeans.

The antero-posterior measurement of the true molar series gives, in the upper jaw on the right side, 34 mm., on the left, 33 mm., being an average of 33·5, somewhat below Turner's maximum of 36 mm.

In the lower jaw on the right side the antero-posterior measurement is 38 mm., and on the left side 38 mm., as compared with the 40 mm. maximum of Sir Wm. Turner. The excess of the lower over the upper jaw in the antero-posterior diameter of the crowns of the true molar teeth is 4·5 mm.—Turner's average excess being 2·8 mm., and his maximum 5 mm.

The *dental index* of Flower is 47·1°.

I have to thank Professor Thane for much kind help in taking the measurements.

The NATIVES *of* BORNEO.

By C. HOSE.

Mode of Life.

THE races of the Baram District (approximate Lat. 4° 30′ N., Long. 113° 52′ E.), situated in the northern portion of Sarawak territory, may be divided into four large sections, as follows:—

(1) The low country people and the inhabitants of the coast.

(2) The Kayans and Kenniahs, inhabiting the head waters of the Baram River and its tributaries.

(3) The Kalabits—a numerous race of people living inland on the hills and plains, to the north of the Baram River, and in the far interior of that part of Borneo.

(4) The Punans—nomadic tribes, found at the head waters of all the big rivers in central Borneo.

Each of these four divisions comprise a number of sub-divisions speaking different dialects which can, however, be traced to the same origin.

The sub-divisions are as follows:—

(1) Amongst the low country people we find the different dialects of the Malanans, Maroms, Dallis, Kadayans (who must not be confounded with the Brunei Kadayans), Orang Bukits, Long Kiputs, Batu Blahs, Miris, Barawans, and Long Patas. The burial customs of these people present a similarity, excepting where a few extraneous ideas have been introduced by a stronger race, such as the Kayans.

(2) The Kayans and Kenniahs are sub-divided into the Uma Pliaus and Uma Poh Kayans, Long Wats, Uma Pawas, Sibops, Leppu Laängs Madangs, and Leppu Pohun Kenniahs. The first three of the above-named sub-sections are of the Kayan race. The rest are to be regarded as Kenniahs.

(3) The Kalabits are a race of people bearing a very close resemblance to those enumerated under No. 1, possessing many traits and habits in common with the Barawans and Long Patas, formerly inhabiting the country now occupied by the Kayans. They were separated from the low country people and driven out by the Kayans who came from the Balungan and Koti rivers some eight generations back.

The Kenniahs who migrated to the Baram River some hundred years or so before the Kayans, were the only people able to resist the constant raids made by the latter, who, being a blustering, warlike race, almost exterminated the smaller tribes and made slaves of the weaker ones. Naturally the Kayans occupied the best tracts of land consisting of the undulating areas between the swampy low country and the mountains at the head waters; they also confiscated all the caves of the esculent swallows, selling their nests to the traders whenever a Brunei, Malay, or Chinese dared to venture up river amongst them. Kayans often travelled as far as Brunei in their long boats, and some few even adventured as far as Singapore, taking passage in Chinese junks to Labuan to sell the produce of these caves.

(4) Punans. I have no doubt in my mind that this wandering race of people are the aboriginals of the country. In physique they are a fine healthy race, large boned and very strong, with fair skins and a complete immunity from skin diseases. They build no houses, and live upon what they can shoot with the blowpipe and on jungle fruits, and owing to their custom of always living in the shade of the dense forest, are afraid of the sun. They are an honest and unselfish people and they alone of all the races in Borneo do not regard the human head as a trophy of war and the taking thereof as a legitimate act of prowess; and when once well known they undoubtedly prove to be the best mannered people of any of the savage tribes

inhabiting the island. They have large families of from seven to ten children, which is also unusual in Borneo, and though no doubt the weaker members die young owing to the rough life they lead, this fact tends to preserve and improve the physical excellence of the race. They are great hunters, being able to move through the jungle without making the slightest noise, and have a name for every living thing, which name is known by even the small boys. They are wonderfully expert in the use of the blowpipe, shooting their poisoned arrows with such precision that it may be said that they seldom miss even the smallest object aimed at, yet this efficiency with their weapons notwithstanding, they are a very timid race, but can fight in self-defence.

The Punans never plant paddy, but sometimes collect the fruit of a tree called "Pran," which they dry and store for a time. They work india-rubber, and are really the only people in Borneo who systematically work the camphor tree, exchanging the camphor with the Kayans and Kenniahs for tools, tobacco, &c.; the Kayans, not wishing them to know the true value of their products, cut them off from all direct communication with the Chinese and Malay traders.

Polyandry is occasionally practised amongst the Punans, but the instances are very rare, and then it is generally found that a difference of some thirty or forty years exists between the ages of the two husbands, the age of the younger usually corresponding with that of the wife.

They occasionally live in caves, but not for long periods, as the caves, being mostly of limestone formation, are damp and cold, and are consequently liable to breed fevers. When suffering from fever they swallow the poison which they use for their arrows, and which is regarded by them as a valuable medicine when taken internally. Punans who have not mixed amongst the Kayans use no boats, but they are capable of covering great distances in a day on foot, the women of the party carrying almost as much as the men.

All the other races use boats, excepting those who live far inland and away from the large rivers, as for instance, a few of the Kalabit tribes. The Kayans and Kenniahs use both long and short boats—a long boat, cut out of the trunk of one of the large forest trees (the native name of which is *Aroh*), sometimes measuring thirty-eight yards in length, and seven feet in beam; a boat of this description will accommodate a hundred men who sit two abreast plying their paddles on either side of the boat simultaneously, and thus propelled it attains a rate of speed enabling it to travel (at a rough calculation) between fifty and sixty miles in a day. The common name given to this boat is

Harok; a smaller boat propelled by about twenty paddles is known as a *Temoi*, and they also make use of various little dugouts of all sizes, for travelling between their houses and rice plantations.

The boats used by the coastal people are most suitable for entering the mouths of rivers, and are called *Barongs* and *Tukaus*; they are good surf boats and will stand a bad sea if properly handled. The Malanaus (coast tribe) are very skilful in taking one of these boats into the mouth of a river when there is a heavy sea running, the *modus operandi* being as follows:—They bring the boat up to a big wave rolling in, and ride on the top of the wave a distance of two hundred yards, paddling hard all the time to keep pace with its momentum and in order to get into smooth water before the succeeding big wave reaches and breaks over them, and when skilfully done, this manœuvre forms a very pretty sight. These people also use various kinds of small boats.

All the various races excepting the Punans, employ dogs in hunting; in speaking of Punans in this way it must be understood that I refer only to those who have not mixed with other races, as those Punans who have come in contact with the Kayans, have adopted many Kayan habits and customs.

The hunters are armed with a long spear and a sort of chopper (*parang*) and hunt on foot usually in parties of from three to ten. They kill numbers of wild pigs and deer, and I believe that every race in Borneo except such as are Mahomedan, will eat wild pig, but the Kayans will not eat deer or wild cattle. Kenniahs again will not eat the large lizards, but Kayans will kill the deer when they get an opportunity and the Kenniahs will kill the lizards. So also the Kayans will not kill the Borneo tiger-cat (*Felis nebulosa*) or even touch the animal, but they will buy its canine teeth for large sums from the Kenniahs and use them to put through their ears, and though the Kenniahs may kill it, I doubt if they dare to treat its flesh as an article of diet. Only a Kenniah chief is allowed to wear the skin of a real tiger as a war coat, and then only if he has had a propitious dream during sleep with the tiger skin hanging over his head. Before lying down to sleep the chief explains to the skin the use he wishes to make of it and begs the spirit to tell him the truth in his dreams as to his future fate. The call of certain birds is to them an omen when they are out on a hunting expedition, and they are influenced by these birds in almost all their daily actions.

They devise various kinds of traps, usually of the nature of a spring trap made with a bent sapling, and some of them are very ingenious.

Fishing is done in various kinds of ways but perhaps the most efficient, though not the most sportsman-like method, is that of poisoning the water for a time by means of the juice of a root called the *Tuba* root.

This root is beaten into a pulp in the bottoms of small boats which are upset on a given signal, and as the white milky juice floats down the river it has the effect of intoxicating the fish and sending them to the surface when they are easily speared by people in small boats which cover the river by hundreds. Sometimes as much as a couple of tons of fish are taken in a few hours by this method which in no way renders the fish unfit for eating purposes; it is always a great event and hundreds of boats crowded with the fairer sex turn out to see the fun—the sight reminding one somewhat of the Cam in the May week.

The casting net is also used, and on the coast the seine net, but fish are so abundant that few people are content to use a rod and line, though occasionally one sees a man fishing in this way; fish are also caught in traps of various kinds in large numbers. The fish spear (*sarampang*) is so arranged that when a fish is struck the head of the weapon comes out of the socket, but the head being tied to the bamboo shaft, it is impossible for a fish to remain long under water as the bamboo is always bearing it to the surface, when another spear is plunged into the fish and it is secured.

The usual way of cooking rice is in a small brass or iron pot, called a *Priok*, while vegetables and small pieces of meat are boiled in an iron pan (*qualli*); fish forms one of the staple articles of diet.

At meals, they usually drink only after they have finished eating, as they contend that by abstaining from taking liquid with their food they prevent indigestion; the men usually feed alone, attended on by the women, and always wash their mouths out when they have finished eating. They are very particular about being called away from their meals, and it takes a great deal to make a man set about doing anything before he has concluded his repast; to such an extent is this practice observed, that it is considered wrong to attack even an enemy whilst he is eating, but the moment he has finished it is legitimate and proper to fall upon him. To the lot of the women falls the cooking and the fetching of water.

Since matches have become an article of commerce, one seldom sees the natives using anything else, but occasionally a flint and steel is produced, and when neither flint and steel nor matches are forthcoming, a fire-drill is made. The fire-drill consists of a piece of soft dry wood in which a small groove is

cut; into this is inserted the point of a piece of hard wood, and the friction caused by this being turned very rapidly by a movement of the hands results in the smouldering of the small head of dust in the groove, from which a spark is soon obtained. Another of their appliances for the same purpose, outwardly resembles a kind of piston which is struck a sharp blow with the hand, whereupon, in some inexplicable manner, it produces a spark.

Fire is the medium through which people converse with the spirits and omen birds, in certain cases, as for instance, should a man hear the cry of a bird which is a bad omen, he lights a small fire telling it to protect him, and the fire is supposed to speak to the omen bird on his behalf. Another instance of the kind in which the fire would be thus regarded, is as follows:—A man has planted fruit trees and when they are in fruit, he places some round stones in cleft sticks near the trees and then proceeds to curse anybody who may venture to steal his fruit, calling these stones to witness the anathema. The curse invoked is somewhat of this nature, "May whoever steals my fruit suffer from stones in the stomach as large as these stones, and if necessary, become a figure of stone!" (*batu keidi*). Now supposing a friend passes by and wishes to gather some fruit for himself, he lights a fire and tells the flame to explain to the stone that he is a friend of the proprietor of the fruit and desires to eat thereof; the fire having explained all this satisfactorily to the stone, the visitor may safely pluck and eat, but woe betide a man who is not a friend and yet dares to take the fruit.

The houses usually stand about 20 feet above the ground on huge posts made of *billian*, and other hard woods, and sometimes are 400 yards in length and often hold over a hundred families; a shingle roofed verandah runs along the front of the house for its entire length, and from this there is a door leading to each room in the house, the said rooms each measuring some 7 yards in length by 3 in breadth and containing five people on an average. Excellent workmanship is displayed in the construction of these houses which are very massive throughout, the floors (to mention one item) being usually of planks about 30 feet long and 4 feet wide with a thickness of 2 inches. All the parts of the house are made ready for putting together, and then on a given day when the omens have been consulted, every man, woman, and child lends a hand, each contributing in one fashion or another a measure of assistance towards the labour of erecting the structure, and while this is proceeding a few small boys are told off to beat gongs and make a noise in order that bad omens may not be heard after a good augury has been obtained.

These long houses are sometimes erected in two or three days, all labouring to the greatest extent of their capacity, while the chief keeps order and gives directions, and the amount of work which is crowded into so short a space of time is wonderful to contemplate. The furniture of these dwellings consists of a fire-place, a few rude stools, and chairs carved out of one solid block of wood, are sometimes to be seen; huge slabs of wood, measuring 8 feet by 7 feet, are used for seats, and a description of shelves are sometimes put up in order to provide beds for the young unmarried men; mats, very neatly made of rattans, serve as sleeping mats, and to cover the floor; and the firewood is all stacked ready for use in the empty space above the room.

When a house was erected in the olden days, the first huge post put into the ground was put through the living body of a slave, usually a young girl, but happily such barbarous customs have been long abolished.

When an attack is expected the house is fortified by a sort of chevaux de frise placed round it, and though this is limp, the ends of the bamboo being pointed and very sharp make it a very difficult obstacle to break through. In addition to the foregoing, numbers of spikes of bamboo, burnt in order to harden them, are set in the ground in concealed and unexpected places and prove very destructive to naked feet.

The only cultivation attempted by the tribes of the interior is for the purpose of supplying their immediate wants and only such as is necessary to produce, rice, sweet potatoes, bananas, tobacco, sugar cane, and maize; the coastal people, however, grow a quantity of sago. The people of the interior collect rattans, gutta percha, india rubber, beeswax, camphor, and edible birds' nests. They have a few useful agricultural implements sufficient for their wants, such as a very handy axe (*beliong*), suitable for felling the forest before burning; a sort of chopper (*parang*), for cutting the undergrowth and light timber; a hoe for weeding in the paddy fields; and a description of pestle and mortar for husking the paddy. The Kayans are very good blacksmiths, possessing forges and anvils, and in former days they smelted their own iron; their workmanship is neat and serviceable, and the engraving with which they adorn their weapons, &c., is finished and artistic.

Religion and Customs.

The Kayans possess wooden idols called "*Odoh*," but it is only on certain occasions that they are regarded as being of much importance. The interpretation of the cries of "Omen

Birds," and the inspection of pigs' livers constitute their highest forms of divination. The "Omen Birds" are the white headed black hornbill, the large hawk, the "*Talajan*," or rain bird, the bee-eaters, and a snake distinguished by a tail ending in a red tip, "*Untup*." When they wish to consult the gods as to whether some event of importance is likely to happen, or to obtain advice, a pig is brought in tied by the legs, and the chief talks to the pig, for this occasion, invoking it by the dignified title of "*Balli Boin!*" (literally "spiritual pig"); he then takes some burning embers and passes them round the back and sides of the animal, very close to the skin, but not touching it. Then he adjures the pig to speak the truth, and explains to him it is advisable to take such and such a step or not. After which the pig is killed, the blood being caught in a big gong and the carcass cut up and the liver taken out for inspection. If the liver is blotched or spotted, it is a very bad sign; if it is held together strongly by the larger blood-vessels, the position these bear to each other is considered; or if the gall bladder is in any way overlapping the liver, this is also taken as a sign that the omen is unfavourable. But, if the liver is healthy and free from all blemish then the omen is favourable, and the pig can be eaten. In some cases if the animal is a small one, it is placed in a cleft stick outside the house together with a few eggs and sometimes a fowl or so, in order that the spirits may regale themselves thereon, but that is usually in the case of a person suffering from some long illness, who wishes to make an offering to the gods when the omen has proved favourable.

Amongst the Kayans in former time, certain forms of the trial by ordeal were in vogue, such as thrusting their arms into a vessel of boiling water and recovering therefrom a small pebble to prove that their hands had touched the bottom, but this is now of very rare occurrence. However they still very occasionally settle small disputes by the practice of a custom known as *Menyallum* (diving). Take the case of a disputed ownership of a fruit tree, such as the durian, which after the lapse of twenty years from the date of planting, commences to bear fruit. Probably the original owner, *i.e.*, the planter, has been dead some years, and no one has paid any attention to the tree because hitherto it has borne no fruit; but no sooner is the tree in full fruit, than several lay claim to the crop.

The two principal disputants as to the ownership of the tree, agree to settle the matter by diving, and call together their friends to witness the trial, hundreds of people lining the banks of the river. The two men take up their positions in about 4 feet of water and each holds forth to the effect that he is the rightful owner, and prays that the water may trouble and enter

the mouth and nostrils of his opponent, calling on the birds and animals to witness his testimony. Two sets of cross-sticks have been driven into the mud at the bottom of the river leaving sufficient room for a man to get his head through, and on a given signal, each of the disputants diving into the water places his head under the cross-sticks, and holds on as long as he can. A friend holds the legs of each and is by this enabled to tell if his principal is going faint, and should the latter faint right off, it is the friend's duty to immediately pull him to the surface. The man who is able to keep under water for the greater length of time is declared the winner, and the loser is not allowed to make any further claim. Sometimes, however, the two men faint off simultaneously, and then the man who first recovers consciousness takes the prize. Very severe measures are resorted to to make them recover the more quickly, for in view of the contingency of both the men fainting a platform has been prepared, and a fire of shavings being lighted underneath, the half drowned man is placed on the platform and almost roasted. This rough treatment very soon causes one of the parties to regain his senses, and he is then held to have established his claim, and all the time this ordeal is proceeding the wildest excitement prevails amongst the friends of the rival claimants.

The Kayans have a curious, if somewhat childish, custom, of foretelling whether an absent friend is proceeding further from home or likely soon to return. A spear, usually about 7 or 8 feet long, is produced—if possible, the property of the absent one—and his nearest relative or some influential person taking the spear in his two hands, extends them apart along the shaft as far as he can reach. The distance between the two hands is marked on the spear-shaft with a piece of clay or something of that nature, and the man speaks to the spear, adjuring it to speak the truth, &c., and then stretches his hands apart again. If the length of his reach on the spear-shaft should measure more on the second trial than at the first attempt, it is taken as an indication that his friend is coming home; if it measures less, it means that he is going further away; while if it measures the same, it is a sign that his friend is resting in someone's house and has not yet made up his mind what he will do. A man will generally stretch further at his second attempt, for it is generally most probable that his friend has commenced his homeward journey, and in any case the thought of his so doing is at least comforting to his relations.

In order to consult the occult powers as to whether it is going to rain, or if it is expedient to make a journey on the following day, four bears' teeth each suspended by two strings, the opposite ends of which are all twisted together, constitute the necessary

mechanical medium. The person seeking information has to select two ends from the twisted mass of string, it being impossible for him to see with which tooth or teeth the strings he chooses are connected. The teeth are then let go, and the resulting tangle may be interpreted variously into eight favourable and eight unfavourable answers according to the relation the strings bear to the teeth, &c.

In taking an oath, the teeth of tiger-cats are employed; the person swearing holding the teeth in his hand and calling on them to harm him if he is not speaking the truth.

A man who has been suffering from a bad illness, on recovery will often change his name, in the hope that the evil spirit who caused his illness will be unable to recognise him under his new name. In such a case his former name is never again mentioned.

Kayans believe in a future state and in a supreme being—"*Laki Tengangang.*" When the soul separates from the body, it may take the form of an animal or bird, and, as an instance of this belief, should a deer be seen feeding near a man's grave, his relatives would probably conclude that his soul had taken the form of a deer, and the whole family would abstain from eating venison for fear of annoying the deceased. The places for disembodied spirits are Tan Tekkan, Apo Leggan, Long Julan, and Tenyu Lallu. The mourners deposit various things with the dead, consisting for the most part of articles of apparel, weapons, and tools, and a small quantity of food. In olden days when a chief died, it was customary to bury living slaves along with the corpse; and only two years before the district came under Sarawak rule, three slaves were buried alive in the grave of one Balawing, a Kayan Chief of the Baram. The articles of clothing and weapons deposited with the dead, are of the highest value, no broken or damaged article being deemed worthy of a place in the grave, as they wish the spirit of the deceased to appear to advantage on his arrival in the other world, and from this it appears the belief is entertained that the articles are actually used. The funeral rites would require a complete paper for their adequate description, and cannot be further touched on here.

Spinning and weaving is practised but little by the Kayans, but almost all the other races in Borneo manufacture some kind of cloth. The Kayans use the bark of a tree to make coats and waistcloths, and I have even seen a mosquito curtain formed of this material. The patterns of these cloths are very artistic, the dye used being made from the fruit of the rattan, the juices of various roots, and the sap of some trees. The yellow dye used by the Dyaks is known as *Intamu* and the red as *Jeranang*.

They have no knowledge of the manufacture of glass or beads—a description of ornament of which both the Kayan men and women are very fond; some of the beads in their possession are very old and greatly prized by the owners, being valued by them from $60 to $100, and the most valuable of which are known as *Lukut Sekala.* Their armlets are usually of ivory, bought from the Chinese and other traders, and the women may sometimes be seen with as many as thirty bangles of ivory rings on each forearm.

The Kayans are a very musical race and possess many musical instruments. Amongst these are:—a reed organ (*kaluri*), a sort of banjo (*sapeh*), gongs (*tetawak*), drums (*gendang*), a jew's harp (*aping*), a bamboo harp (*paking*), and a nose flute (*silingut*).

The Kayans dry their tobacco in the shade, and it is not at all badly prepared; it is wrapped in the leaf of the wild banana, which dries almost like paper and has a peculiar scent, and is thus smoked in the form of a cigarette, a Kayan being seldom seen without one between his lips, for all the race are great smokers. In the ceremony of the blood-brotherhood, a drop of blood is often mixed with tobacco and smoked in a cigarette, the smoke being inhaled into the lungs in some cases, to show the sincerity of the bond.

Cupping is practised by the medicine men, small joints of bamboo being used for the purpose.

Blood-letting about the skin is a very common practice, and I have often seen a man take a small knife and make slight incisions in another's leg till the whole limb was smothered in blood.

As before stated, the Kayans and Kenniahs for years smelted their own iron, and the weapons made of that steel retain their value to the present day. They are great blacksmiths and skilful engravers on metal, some of their work bearing the closest examination. Their forge is an ingenious, if laborious, contrivance, consisting of several large bamboos into each of which a piston worked by hand forces the air; this is conducted by means of other bamboo tubes into one, the end of which forms as it were, the mouth of the bellows, and in which a considerably accumulated pressure of air is obtained. The anvil is likewise ingenious, being provided with many points and small holes by means of which the smith is enabled to bend and work his iron.

The Kayans are particularly fond of tattooing; the men more so than the women. A Kayan woman is tattooed on the upper part of the hands and over the whole of each forearm; on both thighs to below the knees, and on the upper part of the feet and toes. The pattern is so close that at a slight distance the tattooing appears simply as a mass of dark blue, and the designs—some of

which are very pretty—usually consist of a multiplicity of rings and circles. A man is supposed to tattoo one finger only, if he has been present when an enemy has been killed, but tattoos hands and fingers if he has taken an enemy's head. The chiefs, however, often break through this rule, and have the whole of their hands tattooed if they have been on a single war expedition. The Kenniah women do not tattoo their thighs and legs as much as the Kayans, but they usually have their feet and hands and forearms thus ornamented. The men have designs on the underside of the forearm and sometimes on the thigh, and different races are characterised by different designs.

The Kalabits have long lines right down the arm from the biceps to the hand. The Punans tattoo but little. But a race of people called Bakatans tattoo their faces and chests to such an extent that only a small portion of the skin of those parts is free from it.

The teeth are filed by nearly all the races of Borneo at any age, and in many cases drilled with holes in which brass wire is inserted. Both the men and women of the Kayan and Kenniah races at the age of fifteen pluck out their eyebrows and eyelashes, and pierce holes in the ears of their children when the latter are from two to three years of age. From these holes—in the case of a girl—they hang heavy weights, adding to them yearly, till the opening in the elongated ear-lobe is sufficiently large to allow of the girl inserting through it her own head; in the case of some women I have seen as much as two pounds weight depending from the lobe of each ear. The men wear light earrings, and the lobes of their ears usually hang down about 2 inches.

None of the Kayan or Kenniah races wear nose or lip ornaments. The men of these two races wear only a cap or large tuft of long hair which hangs down the back, on the top of the head, all the rest of the scalp being shaven. This way of wearing the hair is, I consider, the last remnant of the Chinese pigtail, and I firmly believe that the Kayans, Kenniahs, and Punans are all descended from a Chinese stock.

The dress of the Kayan women is a cloth reaching from the hips to the ankles, tied at the hips, but open all down one side, leaving room for them to walk easily. They wear a string of beads round the waist, and a small ribbon of beads attached to some cloth is often worn on the head to confine the hair so that it shall fall evenly over the shoulders.

The costume of a Kayan warrior consists of a round cap (*lavong*), covered with hair of various colours, and two huge eyes to represent a face, with the long tail feathers of the hornbill stuck into the top; a war-jacket (*sunong*) made of a goat skin

with a butterfly worked in beads between the shoulders, and a large thick shell (*blasung*) on the breast, and the whole of the back covered with hornbills' feathers. Underneath this a quilted jacket is often worn as a protection against poisoned arrows, and a small mat about 18 inches long and a foot wide, hangs behind, and is used for sitting on when in the jungle. He carries a spear (*bakin*) in his right hand, and a shield (*kalavit*) in his left, while his long sword (*parang ilang*) in its sheath, is fastened round his waist on his left side, if he is a right handed man. He carries his rice and other small requirements in a description of basket (*sarut*), provided with two straps, on his back. Only chiefs, or those who are known as the "*bangsa rajah*," are allowed to wear the feathers of the helmeted hornbill, which is called by them *tebououl*, but they are not so particular about the feathers of the rhinoceros hornbill which are black and white, though a youth of no importance would not be allowed to wear even these. If a man has taken the head of an enemy, he is made much of by the women, and, if unmarried, mothers and fathers are anxious to secure him for a son-in-law.

Ivory is obtained from the traders, no elephants being found in the Kayan District, though they are often seen in large droves in the northern part of Borneo, and the Kayans have adopted the Malay name of *gagah* for them, possessing no word of their own to describe these animals.

The Kayans are great wood carvers, and if some of their work is rough, most of it is very pretty and artistic in design. It generally represents fruits, leaves, and creepers, or human figures, and they usually employ a not very hard, but tough, wood, known to them as *meddang* and *maranti* for this purpose.

Prior to the cession of the Baram district to Sarawak by the Sultan of Brunei, money was not used, and the trade consisted of merely an exchange of jungle produce for cotton goods, grey shirting, turkey red and yellow cloth. The district has now been under Sarawak rule for ten years, and in consequence of the enormous increase of trade, the current dollars and cents have found their way far into the interior, so that even the Punans know the purchasing power of dollars, and it is common now to see the dollar coin on necklaces worn by children.

The Kayans, and many other races in Borneo, fix the time of the year for planting paddy, by observing the position of the stars, though it is more usual for Kayans to be guided by the sun. In the case of reckoning by the stars, they consider that when the Pleiades appear just above the horizon as daylight breaks (five o'clock) that the right time of the year for sowing has arrived. But paddy may be planted and produce a good crop within three months; the low country people are much

later than the hill people, and those who plant swamp paddy even later still. The Kayans measure the shadow of the sun from a horizontal post at twelve o'clock; other shadows cross the large shadow, and the man in charge of this sun-dial has various scales on pieces of wood, but these, and the methods of calculation, together with the sun-dial, which is enclosed by a high fence, are all kept a close secret. But I must admit that they are able to reckon by these measurements how long it is to the time of planting, and I have found that they do not vary much one year from another. I hope some day to have all this explained to me.

A man wishing to describe the time he will be away, says, "I shall be away so many nights," not, so many days. If asked what time you will arrive, he will answer, "when the sun is in *that* position," pointing to the sky; if wishing to indicate nightfall, he will say, "when the sun has gone under"; and early dawn, "when the sun has come up." A man desirous of describing a fish he has caught, would say it was as big as his forearm, or if larger, as big as the calf of his leg. The graduated scale of measurements they use, are:—the size of the thumb; two fingers; three fingers; four fingers; the wrist; the forearm; the calf of the leg; then the thigh or the head; and lastly, the body.

As an equivalent for our inches and feet the natives use fingers—one, two, three, four; four fingers constituting the breadth of a hand; their span consists of that between the thumb and first finger, and a long span, in some cases, between the thumb and second finger, but the latter measurement is not generally allowed, as the following story will show. I was once, while seated in a house talking to the chief, a witness of a heated dispute which took place between two of his followers anent the sale of a pig. A pig is sold by measurement, the measurement being taken (by means of a string) of the girth of the body just behind the fore-legs; and for every spans-length of string, a dollar has become the fixed price. Now the buyer wanted to use the span of the second finger and thumb; the seller of course objected, as in a large pig the use of the longer span would materially decrease the price. After a heated discussion, both parties appealed to their chief to give a decision. I was anxious to see how the old chief would get out of the difficulty, as it was evident he did not wish to offend either of them, and, on the whole, I think he managed very cleverly.

Both the disputants sat down in front of him and explained the point of contention, whereupon he said to the buyer, "now if you were pointing at a man," (pointing at a man's eyes is a form of insult) "and were to do it with your second finger," (at

the same time pointing with *his* second finger), "how foolish it would look, would it not?" The buyer was obliged to admit that it would be so. "Well then," said the chief, "the first finger is the one to use, and we won't adopt any new fads in this house." The two men went away, satisfied with the chief's decision, and the pig was sold.

Many of the tribes adopt the names of animals and common objects such as—*Lang*, a hawk; *Bangau*, a stork; *Apoi*, fire, and so on. Amongst the Kalabits, a chief who wishes to impress people with his greatness often adds the word *langit*, the heavens, to his other names. This implies that he is a very important personage, literally, that the heavens belong to him.

When a child is born, the father and mother sink their own identity, and adopt the name of their offspring. Supposing a man named Jau becomes the parent of a son to whom he gives the name of Lahing, the former would no longer be called Jau, but Taman Lahing, father of Lahing. If his child were to die, he would be called Ozong Lahing, or Ozong Jau; if his wife dies, he adds the prefix Aban (widower) to his name; if a brother or sister, Boi, and is called Boi Lahing. Should he attain the position of being a grandfather, he becomes Laki, adding thereto the name of his grandchild, so if the latter is given the name of Ngipa, the grandfather is no longer called Taman Lahing, or by any other name but Laki Ngipa. A widow is called Ballo.

Many fruits are forbidden, and some articles of diet which may be eaten singly, may not be taken together, as for instance the young leaves in the heart of the bealb nut tree (Arica palm) known as the cabbage, which may be made into salad, or eaten when cooked, but if mixed with a small fish known as Saluang, it causes violent convulsions. The fish, which is a particularly good one, may, however, be eaten alone.

The system of "taboo" is greatly practised by the Kayans during the times of planting and harvesting the crops, and more especially when the paddy is being stored. At such a time none may enter the house but those residing in it, and even they may not enter each other's rooms, the reason for this prohibition being simply that the people do not wish the extent of their harvest to be known. Anyone may taboo his own room, but it is the chief, who, with the advice of his followers, taboos the house or the river. Small fines are imposed for infringing the taboo, if it is done unintentionally, but in the case of a man forcing his way in a house that is tabooed, a serious quarrel is often the result, and this has sometimes ended in bloodshed, but it is a very rare thing to find a man acting thus, as all the people have some form of taboo in their own houses. After the

harvest, a great deal of drinking and merry making is indulged in, and at this time a great many marriages take place.

There are certain times when the relatives of a deceased person visit his grave, but without there is some special reason, such as a division of property amongst the descendants of the dead, this is but seldom done. The name of one who has died, is not mentioned in the same manner as whilst he was living; the Kayans put the word *urip* before his name which signifies "the spirit of the deceased."

The Kayan and Kenniah chiefs are much looked up to by their followers, and have great power over the people; they are usually very intelligent and well-behaved men, and have the manners of gentlemen rather than of savages.

Discussion.

Sir H. Low: I have listened with great pleasure to the very interesting paper by Mr. Hose. The Punans and the Kyans are amongst the less known of the tribes of Borneo, and although I was not in the districts they chiefly inhabit, I had opportunities occasionally of meeting them, and can certify to the very accurate description which Mr. Hose has given of them. I congratulate him on the opportunities he will have in the future for further studying these interesting tribes, and have no doubt that we may look upon the valuable paper which has been read to us, as an earnest of further information which he will collect for this Institute and through it for European science.

The interesting points in the lecture were so numerous that one's memory fails to follow them on the spur of the moment.

I once met with two families of Punans in the mountains of the Lawas river, opposite to the island of Labuan. These consisted of two men, three women, and three children. They were of a lightish brown colour, with pleasing features, gentle manners, and of graceful figures and had been living for about two months in the spot in which I saw them. Their only shelter was formed by a few palm leaves stuck at an angle by their stems in the ground and they said they were about to move from this place, as game was becoming scarce. From a cross bar resting at either end on two forked poles stuck into the ground, hung about twenty lower jaws of the large wild pig of Borneo (*Sus verruccosus*), with other trophies of their successful hunt. Their weapons were the sumpitan or blow pipe, spears and chopping knives, and they told me that they were the sole survivors of a community of more than fifty families, of which the oldest man, about forty years of age, remembered the tribe to have consisted. They planted no rice or other vegetables, but lived entirely on the wild animals and vegetable produce of the primeval forest in which I found them. They were very grateful for a little tobacco with which we supplied

them. The Kyans I occasionally saw on rare visits which some of their chiefs made to Labuan, and I quite concur in the opinion of Mr. Hose as to the relative character and capacity for development of the Dyaks, Kyan, and Punan races of Borneo. With regard to the Mongolian features which are so very apparent on some of the excellent slides exhibited, it is to be remarked that, if a Chinese ancestry is responsible for this, it is curious that not only in the tribes under consideration, but amongst the Dusuns of the rivers in the territory of the N. Borneo Company, where Chinese descent rests on undoubted evidence, no trace of the language is to be found in the dialects at present in use. It is recorded in the Annals of the Kingdom of Borneo, that, in the latter half of the 15th century A.D., the daughter of the first Mahommedan Sultan of Borneo was married to one of the commanders of an expedition which had been sent by the Emperor of China to endeavour to procure the famous jewel, supposed to be guarded by the dragon of the great mountain Kina Babi. This officer, named Ong Sum Ping, on the return of the expedition to China, elected to remain with many of his followers in Borneo, embraced the religion of Islam, and under the name of Sultan Achmed became the second independent sovereign of the kingdom which had before been a dependency of the Hindu Kingdom of Majapahit in Java. From this time, intercourse with China seems to have been frequent down to the end of the last century, and many settlers of that nation were found living as pepper planters and cultivators in Borneo, when, about 1774, the East India Company established a trading factory in the town of Brunei. This factory was subsequently withdrawn and intestine troubles were so unfavourable to the Chinese settlers that no trace of these remain near the capital, though descendants of the race are found in the outlying rivers, who have adopted the language and habits of the Dusuns. Emigrants from China, till about thirty years ago, consisted of men only. When they settled in Borneo, they married women of the native race, which of course tended to the absorption of their descendants into the national stock. The first poison mentioned in the paper is derived from the juice of the roots of the Derris Elliptica, a papilionaceous plant, with a pendulous racime of flowers resembling those of the Wistaria, but of a purple plum colour and with a rich perfume. The poison used for the darts of the blow pipe or sumpitan is derived from the sap of the celebrated Upas tree, is called Ipoh in Brunei and in the Malay Peninsula, and which, when properly prepared, is a very active poison. A very interesting article on this poison may be found in the Bulletin of the Kew Royal Botanic Gardens for 1891, at p. 259; plants of this tree, Antiaris toxicaria and the Derris Elliptica, may be seen in Kew Gardens. The sumpitan or blow pipe used by the Kyans is made of very hard wood, and the bore is drilled with the greatest accuracy.

ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

Address to the Anthropological Section of the British Association.

By Robert Munro, M.A., M.D., F.R.S.E.,
President of the Section.

The science of anthropology, in its widest sense, embraces all the materials bearing on the origin and history of mankind. These materials are so comprehensive and diversified, both in their character and methods of study, that they become necessarily grouped into a number of subordinate departments. From a bird's-eye point of view, however, one marked line of demarcation separates them into two great divisions, according as they relate to the structure and functions of man's body, or to the works he has produced—a classification well defined by the words *anthropology* and *archæology*. The former, in its limited acceptation, deals more particularly with the development of man—his physical peculiarities, racial distinctions, linguistic manifestations, mental endowments, and, in short, every morphological or mental modification he has undergone amidst the ever-changing phenomena of his environments. The latter, on the other hand, takes cognisance of man merely as a handicraftsman. During his long journey in past time he has left behind him, scattered on the highways and byways of primeval life, numerous traces of his ways, his works, his culture, and his civilisation, all of which fall to be collected, sorted, and interpreted by the skilled archæologist. In their general aspects and relationship to each other most of the leading subjects in both these branches of the science have already been expounded in the presidential addresses of my predecessors, by men so distinguished in their respective departments that they have left little to be said by anyone who attempts to follow in their footsteps. There is, however, one phase in the progressive career of man which has not hitherto been so fully illustrated as the subject appears to me to merit. I refer to the direct and collateral advantages which the erect position has conferred on him; and to this I will now briefly direct your attention, concentrating my observations successively on the following propositions:—

(1) The mechanical and physical advantages of the erect position.

(2) The differentiation of the limbs into hands and feet.

(3) The relation between the more perfect condition of these organs and the development of the brain.

In the process of organic evolution it would almost appear as if nature acted on teleological principles, because many of her products exhibit structures which combine the most perfect adaptation of means to ends along with the greatest economy of materials. This is well exemplified in some of the structural details of the organs of locomotion in which many of the so-called mechanical powers may be seen in actual use. The primary object of locomotion was to enable the organism to seek its food over a larger area than was attainable by a fixed position. The acquisition of this power was manifestly so advantageous to animal life that the principles by which it could be effected became important factors in natural selection. I need not here dwell on the various methods by which this has been accomplished in the lower forms of life, but proceed at once to point out that in the higher vertebrates the problem resolved itself into the well-known mechanism of four movable limbs, capable of supporting and transporting the animal. As these quadrupedal animals became more highly differentiated, in virtue of the necessities of the struggle for life and the different and ever-varying conditions of their surroundings, it followed that the limbs became also modified so as to make them suitable, not only for locomotion in various circumstances, but also useful to the animal economy in other ways. Hence they were subjected to an endless variety of secondary influences, which finally adapted them for such divers purposes as swimming, flying, climbing, grasping, &c. The anterior limbs, owing to their proximity to the head, were more frequently selected for such transformations as may be seen, for instance, in the wings of a bird. But whatever modifications the fore limbs may have undergone, no animal, with the exception of man, has ever succeeded in divesting them altogether of their primary function. This exceptional result was due to the erect position, which necessitated a complete division of labour as regards the function of the limbs—the two anterior being entirely restricted to manipulative and prehensile purposes, and the two posterior exclusively devoted to locomotion. Coincident with this notable specialisation of their function a new field for advancement was opened up to man, in which intelligence and mechanical skill became the leading factors in his further development.

Man is thus distinguished from all other animals by the fact that, in the normal position of walking or running, he carries his body upright, *i.e.*, with the axis of the vertebral column perpendicular, instead of horizontal or oblique. In this position all its parts are so arranged as to require a minimum amount of exertion in the performance of their functions. If any of the other higher vertebrates should ever assume an erect attitude it can only be maintained temporarily, and its maintenance involves an additional

expenditure of force. In a certain sense a bird may be looked upon as a biped, but there is this distinction to be drawn between it and man, viz., that the former has not only its body balanced obliquely on its two legs, but also its fore limbs converted into special organs for motion in the air. The anthropoid apes hold an intermediate position, and so carry their body in a semi-erect attitude. But this shortcoming in reaching the perfectly upright position, however slight it may be in some of these animals, represents a wide gap which can only be fully appreciated by a careful study of the physiological and psychological phenomena manifested in their respective life-functions.

Everyone acquainted with the ordinary operations of daily life knows how much labour can be saved by attention to the mere mechanical principles involved in their execution. In carrying a heavy load the great object is to adjust it so that its centre of gravity comes as nearly as possible to the vertical axis of the body, as otherwise force is uselessly expended in the effort to keep the entire moving mass in stable equilibrium—a principle well exemplified by the Italian peasant girl when she poises her basket of oranges on her head. Once upon a time a powerful waterman, accustomed to use buckets double the size of those of his fellow-watermen, had the misfortune to have one of them broken. As he could not, then and there, get another bucket to match the remaining one, and wishing to make the best possible use of the appliances at hand, he replaced the broken vessel by one half its size. He then filled both with water and attempted to carry them, as formerly, attached to a yoke, one on each side of him. But to his astonishment this arrangement would not work. The yoke became uneven, and the effort to keep it balanced on his shoulders was so troublesome that he could not proceed. This emergency led to serious reflection, but, after some experimental trials, he ascertained that, by merely making the arm of the yoke on which the small bucket was suspended double the length of the other, he could carry both buckets without inconvenience.

But let me take one other illustration. Suppose that two burglars have concocted a plan to rob a richly-stored mansion by getting access to its rooms through the windows of an upper story. In order to carry out this design they secure a ladder, easily transported by the two together though too heavy for one. So, bearing the ladder between them one at each end, they come to the house. After a considerable amount of exertion they succeed in placing the ladder in an upright position against the wall, and then one of the men mounts its steps and enters the house. The man left outside soon realised that, once the ladder was balanced perpendicularly, he himself could then easily control it. Moreover, he made the discovery that by resting its weight on each leg alternately, he could gradually shift its position from one window to another. Thus there was no interruption or limit to the extent of their depredations. Experience quickened their perceptions, and ultimately they become adepts in their respective departments—the

one in the art of moving the ladder, and the other in the science of the nimble-fingered gentry. The division of labour thus practised by these two men accurately represents what the attainment of the erect attitude has accomplished for man by setting free his upper limbs from any further participation in the locomotion of his body.

The continued maintenance of this unique position necessitated great changes in the general structure of the body. The solution of the problem involved the turning of the ordinary quadruped a quarter of a circle in the vertical plane, thus placing the axis of the spine perpendicular, and consequently in line with the direction of the posterior limbs: and to effect this the osseous walls of the pelvis underwent certain modifications, so as to bear the additional strain put upon them. Stability was given to the trunk in the new position by the development of special groups of muscles, whose powerful and combined actions render to the movements of the human body their characteristic freedom and gracefulness. The lower limbs were placed as widely apart as possible at their juncture with the pelvis, and the thigh and leg-bones were lengthened and strenghtened so as to be capable of supporting the entire weight of the body and of transporting it with due efficiency when required. The spinal column assumed its well-known curves, and the skull, which formerly had to be supported by a powerful muscle attached to the spinous processes of the cervical vertebræ (*ligamentum nuchæ*), moved backwards until it became nearly equipoised on the top of the vertebral column. The upper limbs, instead of taking part in their original function of locomotion, were now themselves carried as flail-like appendages, in order to give them as much freedom and range of action as possible. The shoulder-blades receded to the posterior aspect of the trunk, having their axes at right-angles to that of the spine. Further, like the haunch-bones, they underwent certain modifications, so as to afford points of attachment to the muscles required in the complex movements of the arms. In the pendulous position each arm has its axis at right angles to that of the shoulder, but by a common muscular effort the two axes can be readily brought into line. The elbow-joint became capable of performing the movements of complete extension, flexion, pronation, and supination—in which respects the upper limb of man is differentiated from that of all other vertebrates.

But it is in the distal extremities of the limbs that the most remarkable anatomical changes have to be noted. The foot is virtually a tripod, the heel and the ball of the great toe being the terminal ends of an arch, while the four outer digital columns group themselves together to form the third, or steadying, point. The outer toes thus play but a subordinate part in locomotion, and, as their prehensile function is no longer of use, they may be said to be fast approaching to the condition of rudimentary organs. The three osseous prominences which form this tripod are each covered with a soft elastic pad, which both facilitates progression and acts

as a buffer for deadening any possible shock which might arise in the course of running or leaping. The chief movement in the act of progression is performed by an enormously developed group of muscles known as the calf of the leg, so characteristic of man. The walker is thereby enabled to use the heel and the ball of the great toe as successive fulcrums from which the forward spring is made, the action being greatly facilitated by that of the trunk muscles in simultaneously bending the body forwards. The human foot is thus admirably adapted both as a pillar for supporting the weight of the body, and a lever for mechanically impelling it forwards. Hence the amount of energy expended in progression is reduced to a minimum, and when estimated proportionally to the size of the body it is believed to be considerably less than that requisite for the corresponding act in quadrupeds.

The anatomical changes effected in the extremity of the upper limb are equally radical, but of a totally different character and scope. Here we have to contemplate the transformation of the same homologous parts into an apparatus for performing a series of prehensile actions of the most intricate character, but among which neither locomotion nor support of the body forms any part whatever. This apparatus is the human hand, the most complete and perfect mechanical organ nature has yet produced. The fingers have become highly developed, and can be opposed singly or in groups to the thumb, so as to form a hook, a clasp, or a pair of pincers; and the palm can be made into a cup-shaped hollow, capable of grasping a sphere. Nor is there any limit to the direction in which many of these manipulations can be performed without any movement of the rest of the body. For example, a pencil held by the thumb and the two forefingers, as in the act of writing, can be placed in all the directions of space by a mere act of volition acting through the muscles of the fore limb alone.

The position of such a perfect piece of mechanism, at the extremity of a movable arm attached to the upper part of the trunk, gives to man a superiority in attack and defence over all other animals, on the same principle as a soldier finds it advantageous to fight from higher ground. Moreover, he possesses the power to perform a variety of quick movements, and to assume attitudes and positions eminently adapted for the exercise of that manipulative skill with which he counteracts the superior brute force of many of his antagonists. He can readily balance his body on one or both legs, can turn on his heels as if they were pivots, and can prostrate himself comfortably in the prone or supine positions. As the centre of gravity of the whole body is nearly in line with the spinal axis, stable equilibrium is easily maintained by the lumbar muscles. Altogether we have in his physical constitution a combination of structures and functions sufficiently unique in its *tout-ensemble* to place man in a category by himself. But at the same time we must not forget that all his morphological peculiarities have been brought about without the destruction of any of the primary homologies common to all the higher vertebrates.

Turning now to the brain, the undoubted organ of the mind, we find, in its intellectual and psychical manifestations, a class of phenomena which gives to man's life-functions their most remarkable character. However difficult it may be for our limited understanding to comprehend the nature of conscious sensation, we are forced to the conclusion that the act invariably takes place through the instrumentality of a few nerve-cells, whose functional activity requires to be renovated in precisely the same manner as the muscular force expended in walking. The aggregation of such cells into ganglia and nerves, by means of which reflex action, consciousness, and a variety of psychical phenomena take place, is found to permeate, in a greater or less degree, the whole of the organic world. In the higher vertebrates the seat of these manifestations is almost exclusively confined to an enormous collection of brain substance placed at the upper end of the vertebral column, and encased in a complete osseous covering called the skull. We learn from numerous experimental researches, carried out by physiologists in recent years, that the brain is a dual organ, consisting of a double series of distinct ganglia and connected to some extent by a complex system of nervous tissues, not only with each other, but with the central seat of consciousness and volition. But the difficulty of determining the nature of its functions and the *modus operandi* of its psychological manifestations, is so great that I must pass over this part of the subject very lightly indeed. The conditions of ordinary reflex action require that a group of muscles, by means of which a particular bodily movement is effected, shall be connected with its co-ordinating ganglion by an afferent and an efferent system of nerves. Impressions from without are conveyed by the former, or sensory nerves, to the central ganglion, from which an impulse is retransmitted by the motor nerves and sets in operation the muscular force for producing the required movement. But this efferent message is, in many cases, absolutely controlled by volition, and not only can it prevent the muscular action from taking place, but it can effect a similar movement, *de novo*, without the direct intervention of external impressions at all. Now it has been proved experimentally that the volitional stimulus, which regulates the various movements of the body, starts from definite portions of the brain according to the different results to be produced. This localisation of brain functions, though still far from being thoroughly understood, comes very appropriately into use in this inquiry. From it we learn that the homology which characterises the structural elements of the bodies of animals extends also to the component parts of their respective brains. The law which differentiates animals according to the greater specialisation of the functions of their various organs has therefore its counterpart in the brain, and we naturally expect an increase of brain substance in every case in which the functional activity of a specific organ is extended. Thus the act of stitching with a needle and thread, an act beyond the mental and physical capacity of any animal but man, would entail a

certain increase of brain substance, simply in obedience to the great complexity of the movements involved in its execution, over and above that which may be supposed to be due to the intellectual and reasoning faculties which invented it.

That man's brain and his intelligence are correlated to each other is a fact too axiomatic to require any demonstration; nor can it be doubted that the relationship between them is of the nature of cause and effect. But to maintain that the amount of the latter is directly proportional to the size of the former is rather straining the laws of legitimate inference. In drawing any general conclusion of this nature from the bulk of brain substance, there are some modifying influences which cannot be disregarded, such, for example, as the amount of cranial circulation and the quality of the brain cells. But the determination of this point is not the exact problem with which the evolutionist is primarily concerned. To him the real crux in the inquiry is to account for the evolution of man's comparatively large brain under the influence of existing cosmic forces. After duly considering this problem, and casting about for a possible explanation, I have come to the conclusion that not only is it the result of natural laws, but that one of the main factors in its production was the conversion of the upper limbs into true hands. From the first moment that man recognised the advantage of using a club or a stone in attacking his prey or defending himself from his enemies, the direct incentives to a higher brain development came into existence. He would soon learn by experience that a particular form of club or stone was more suitable for his purposes; and if the desiderated object were not to be found among the natural materials around him, he would proceed to manufacture it. Certain kinds of stones would be readily recognised as better adapted for cutting purposes than others, and he would select his materials accordingly. If these were to be found only in a special locality, he would visit that locality whenever the prized material was needed. Nor would it be an unwarrantable stretch of imagination to suppose that the circumstances would lead him to lay up a store for future use. These simple acts of intelligence assume little more than may be seen in the actions of many of the lower animals. Consciousness of his power to make and to wield a weapon was a new departure in the career of man, and every repetition of such acts became an effective and ever-accumulating training force. What a memorable event in the history of humanity was the manufacture of the first sharp stone implement! Our sapient ancestor, who first used a spear tipped with a sharp flint, became possessed of an irresistible power over his fellow men. The invention of the bow and arrow may be paralleled with the discovery of gunpowder and the use of cannon, both of which revolutionised the principles of warfare in their respective ages. The art of making fire had a greater influence on human civilisation than the modern discovery of electricity. The first boat was in all probability a log—an idea which might have been

suggested by the sight of an animal clinging to a floating piece of wood carried away by a flood. To scoop this log into a hollow boat was an after-thought. The successive increments of knowledge by which a single-tree canoe has been transformed into a first-class Atlantic liner are scattered through the unwritten and written annals of many ages. In his expeditions for hunting, fishing, fruit-gathering, &c., primitive man's acquaintance with the mechanical powers of nature would be gradually extended, and *pari passu* with the increasing range of his knowledge there would be a corresponding development in his reasoning faculties. Natural phenomena suggested reflections as to their causes and effects, and so by degrees they were brought into the category of law and order. Particular sounds would be used to represent specific objects, and these would become the first rudiments of language. Thus each generalisation when added to his previous little stock of knowledge widened the basis of his intellectual powers, and as the process progressed man would acquire some notion of the abstract ideas of space, time, motion, force, number, &c.; and continuous thought and reasoning would ultimately become habitual to him. All these mental operations could only take place through the medium of additional nerve cells, and hence the brain gradually became more bulky and more complex in its structure. Thus the functions of the hand and of the brain have been correlated in a most remarkable manner. Whether the mechanical skill of the hand preceded the greater intelligence of the brain, or *vice versâ*, I will not pretend to say. But between the two there must have been a constant interchange of gifts. According to Sir C. Bell, "the hand supplies all instruments, and by its correspondence with the intellect gives him universal dominion."[1]

That mind, in its higher psychical manifestations, has sometimes been looked upon as a spiritual essence which can exist separately from its material basis, need not be wondered at when we consider how the pleasing abstractions of the poet, or the fascinating creations of the novelist, roll out, as it were, from a hidden cavern without the slightest symptom of physical action. It is this marvellous power of gathering and combining ideas, previously derived through the ordinary senses, which gives a *primâ facie* appearance of having here to deal with a force exterior to the brain itself. But indeed it is questionable if such psychological phenomena are really represented by special organic equivalents. May they not be due rather to the power of volitional reflection which summons them from the materials stored up by the various localised portions into which the brain is divided? From this point of view there may be many phases of pure cerebration which, though not the result of direct natural selection, have nevertheless as natural and physical an origin as conscious sensation. Hence imagination, conception, idealisation, the moral faculties, &c., may be compared to parasites which live at the expense of their neighbours. After all the greatest mystery of life lies in the

[1] "The Hand, &c.," Bridgewater Treatise, p. 38.

simple acts of conscious sensation, and not in the higher mental combinations into which they enter. The highest products of intellectuality are nothing more than the transformation of previously existing energy, and it is the power to utilize it that alone finds its special organic equivalent in the brain.

But this brings us on controversial ground of the highest importance. Professor Huxley thus expresses his views on the phase of the argument now at issue:—

"I have endeavoured to show that no absolute structural line of demarcation, wider than that between the animals which immediately succeed us in the scale, can be drawn between the animal world and ourselves; and I may add the expression of my belief that the attempt to draw a psychical distinction is equally futile, and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life."[1]

On the other hand, Mr. Alfred R. Wallace, who holds such a distinguished position in this special field of research, has promulgated a most remarkable theory. This careful investigator, an original discoverer of the laws of natural selection, and a powerful advocate of their adequacy to bring about the evolution of the entire organic world, even including man up to a certain stage, believes that the cosmic forces are insufficient to account for the development of man in his civilised capacity. "Natural selection," he writes, "could only have endowed savage man with a brain a few degrees superior to that of an ape, whereas he actually possesses one very little inferior to that of a philosopher." This deficiency in the organic forces of nature he essays to supply by calling in the guiding influence of a "superior intelligence." In defending this hypothesis from hostile criticism he explains that by "superior intelligence" he means some intelligence higher than the "modern cultivated mind," something intermediate between it and Deity. But as this is a pure supposition, unsupported by any evidence, and, so far as I can see, merely a matter of personal belief, it is unnecessary to discuss it further. I would just, *en passant*, ask Mr. Wallace why he dispenses with this "higher intelligence" in the early stages of man's evolution, and finds its assistance only requisite to give the final touches to humanity?

In dealing with the detailed objections raised by Mr. Wallace against the theory of natural selection as applied to man, we are, however, strictly within the sphere of legitimate argument; and evolutionists are fairly called upon to meet them. As his own theory is founded on the supposed failure of natural selection to explain certain specified peculiarities in the life of man, it is clear that if these difficulties can be removed, *cadit quæstio*. It is only one of his objections, however, that comes within the scope of my present enquiry, viz., that which is founded on the supposed "surplusage" of brain power in savage and prehistoric races.

In comparing the brains of the anthropoid apes and man Mr. Wallace adopts the following numbers to represent their proportional

[1] "Evidences as to Man's Place in Nature," p. 109.

average capacities, viz., anthropoid apes 10, savages 26, and civilised man 32—numbers to which there can be no objection, as they are based on data sufficiently accurate for the requirements of this discussion. In commenting on the mental ability displayed in actual life by the recipients of these various brains he states that savage man has "in an undeveloped state faculties which he never requires to use," and that his brain is much beyond his actual requirements in daily life. He concludes his argument thus:—"We see, then, that whether we compare the savage with the higher developments of man, or with the brutes around him, we are alike driven to the conclusion that in his large and well-developed brain he possesses an organ quite disproportionate to his actual requirements—an organ that seems prepared in advance, only to be fully utilised as he progresses in civilisation. A brain one-half larger than that of the gorilla would, according to the evidence before us, fully have sufficed for the limited mental development of the savage; and we must therefore admit that the large brain he actually possesses could never have been solely developed by any of those laws of evolution whose essence is that they lead to a degree of organisation exactly proportionate to the wants of each species, never beyond those wants; that no preparation can be made for the future development of the race; that one part of the body can never increase in size or complexity, except in strict co-ordination to the pressing wants of the whole. The brain of prehistoric and of savage man seems to me to prove the existence of some power distinct from that which has guided the development of the lower animals through their ever-varying forms of being."[1]

With regard to the closing sentence of the above quotation, let me observe that the cosmic forces, under which the lower animals have been produced by means of natural selection, do not disclose, either in their individual or collective capacity, any guiding power in the sense of a sentient influence, and I believe that the "distinct power" which the author summons to his aid, apparently from the "vasty deep," to account for the higher development of humanity is nothing more than the gradually acquired product of the reasoning faculties themselves. Not that, for this reason, it is to be reckoned less genuine and less powerful in its operations than if it had emanated from an outside source. The reasoning power displayed by man is virtually a higher intelligence, and, ever since its appearance on the field of organic life, it has, to a certain extent, superseded the laws of natural selection. Physical science has made us acquainted with the fact that two or three simple bodies will sometimes combine chemically so as to produce a new substance, having properties totally different from those of either constituents in a state of disunion. Something analogous to this has taken place in the development of man's capacity for reasoning by induction. Its primary elements, which are also those of natural selection, are conscious sensation, heredity, and a few other properties of organic matter, elements which are common, in a more or less degree, to all

[1] "Natural Selection, &c.," 1891, p. 193.

living things. As soon as the sequence of natural phenomena attracted the attention of man, and his intelligence reached the stage of consecutive reasoning on the invariableness of certain effects from given causes, this new power came into existence; and its operations are, apparently, so different from those of its component elements that they can hardly be recognised as the offspring of natural forces at all. Its application to the adjustment of his physical environments has ever since been one of the most powerful factors, not only in the development of humanity, but in altering the conditions and life-functions of many members of the animal and vegetable kingdoms.

I have already pointed out that the brain can no longer be regarded as a single organ, but rather as a series of organs connected by bonds of union—like so many departments in a Government office in telephonic communication—all, however, performing special and separate functions. When, therefore, we attempt to compare the brain capacity of one animal with that of another, with the view of ascertaining the quality of their respective mental manifestations, we must first determine what are the exact homologous parts that are comparable. To draw any such inference from a comparison of two brains, by simply weighing or measuring the whole mass of each, would be manifestly of no scientific value. For example, in the brain of a savage the portion representing highly skilled motor energies might be very much larger, while the portion representing logical power might be smaller than the corresponding parts in the brain of a philosopher. But should these inequalities of development be such as to balance each other, and the weight of the two organs become equal, what, in this case, could be the value of any inference as to the character of their mental endowments? Equal-sized brains do not display equivalent, nor indeed analogous, results. To postulate such a doctrine would be as irrational as to maintain that the walking capacities of different persons are directly proportional to the weight of their bodies. Similar remarks are equally applicable to the skulls of prehistoric races, as it would appear that evolution had done the major part of its work in brain development long before the days of neolithic civilisation. Huxley's well-known description of the Engis skull—"a fair average skull, which might have belonged to a philosopher, or might have contained the thoughtless brains of a savage"—goes far to settle the question from its anatomical point of view. Until localisation of brain functions makes greater progress it is, therefore, futile to speculate, to any great extent, on the relative sizes of the skulls of different races either in present or prehistoric times.

But there is another aspect of the question which militates against Mr. Wallace's hypothesis, viz., the probability that many of the present tribes of savages are, in point of civilisation, in a more degenerate condition than their forefathers who acquired originally higher mental qualities under natural selection. There must surely be some foundation of truth in the widely-spread tradition of the fall of man. And, if such be the case, we naturally expect to find

some stray races with inherited brains of greater capacity than their needs, in more degenerate circumstances, may require. An exact equivalent to this may be seen in the feeble intellectuality of many of the peasants and lower classes among the civilised nations of modern times. Yet a youth born of such parents, if educated, often becomes a distinguished philosopher. It is well known that if an organ ceases to perform its functional work it has a tendency to deteriorate and ultimately to disappear altogether. But from experience we know that it takes a long time for the effects of disuse to become manifest. It is this persistency that accounts for a number of rudimentary organs, still to be met with in the human body, whose functional activity could only have been exercised before man became differentiated from the lower animals. Such facts give some support to the suggestion, previously made, that philosophising, as such, has no specially localised portion in the brain. Its function is merely to direct the current of mental forces already existing.

But, again, Mr. Wallace's argument involves the assumption that the unnecessarily large brain of the savage had been constructed on teleological principles for the sole purpose of philosophising. My opinion is that the greater portion of this so-called surplusage is the organic representative of the energy expended in the exercise of the enormous complexity of human actions, as displayed in the movements of his body and in the skilful manipulations necessary to the manufacture of implements, weapons, clothing, &c. All such actions have to be represented by a larger bulk of brain matter than is required for the most profound philosophical speculations. The kind of intelligence evinced by savages, however low their position in the scale of civilisation may be, is different from, and incomparably greater than, that manifested by the most advanced of the lower animals. To my mind it is much more rational to suppose that the development of the large brain of man corresponded, *pari passu*, with that of his characteristic physical attributes, more especially those consequent on the attainment of the upright position. That these attributes were acquired exclusively through the instrumentality of the cosmic forces was, as the following quotation will show, the opinion of Mr. Darwin:—"We must remember that nearly all the other and more important differences between man and quadrumana are manifestly adaptive in their nature, and relate chiefly to the erect position of man; such as the structure of his hand, foot, and pelvis, the curvature of his spine, and the position of his head."[1] Mr. Wallace, however, considers the feet and hands of man "as difficulties on the theory of natural selection." "How," he exclaims, "can we conceive that early man, *as an animal*, gained anything by purely erect locomotion? Again, the hand of man contains latent capacities and powers which are unused by savages, and must have been even less used by palæolithic man and his still ruder predecessors. It has all the appearance of an organ prepared for the use of

[1] "Descent of Man," p. 149.

civilised man, and one which was required to render civilisation possible."[1] But here again this acute observer diverges into his favourite by-path, and introduces a "higher intelligence" to bridge over his difficulties.

We have now reached a stage in this enquiry when a number of questions of a more or less speculative character fall to be considered. On the assumption that, at the start, the evolution of the hand of man was synchronous with the higher development of his reasoning faculties, it is but natural to ask where, when, and in what precise circumstances this remarkable coalition took place. I would not, however, be justified in taking up your time now in discussing these questions in detail; not because I think the materials for their solution are unattainable, but because, in the present state of our knowledge, they are too conjectural to be of scientific value. In the dim retrospective vista which veils these materials from our cognizance I can only see a few faint landmarks. All the osseous remains of man which have hitherto been collected and examined point to the fact that, during the larger portion of the quaternary period, if not, indeed, from its very commencement, he had already acquired his human characteristics. This generalisation at once throws us back to the tertiary period in our search for man's early appearance in Europe. Another fact—disclosed by an analysis of his present corporeal structure—is that, during a certain phase of his previous existence, he passed through a stage when his limbs, like those of the present anthropoid apes, were adapted for an arboreal life. We have therefore to look for the causes which brought about the separation of man from his quadrumanous congeners, and entailed on him such a transformation in his form and habits, in the physical conditions that would supervene on a change from a warm to a cold climate. In the gradual lowering of the temperature of the subtropical climate which prevailed in Central Europe and the corresponding parts of Asia during the Miocene and Pliocene periods, and which culminated in the great Ice age, together with the concurrent changes in the distribution of land, seas, and mountains, we have the most probable explanation of these causes. Whether man forsook his arboreal habits and took to the plains from overcrowding of his own species in search of different kinds of food, before this cold period subjected him to its intensely adverse circumstances, it would be idle for me to offer an opinion. Equally conjectural would it be to inquire into the exact circumstances which led him to depend exclusively on his posterior limbs for locomotion.

During this early and transitional period in man's career there was no room for ethics. Might was right, whether it emanated from the strength of the arm, the skill of the hand, or the cunning of the brain. Life and death combats would decide the fate of many competing races. The weak would succumb to the strong, and ultimately there would survive only such as could hold their

[1] "Natural Selection," p. 198.

own by flight, strength, agility, or skill, just as we find among the races of man at the present day.

In summing up these somewhat discursive observations, let me just emphasise the main points of the argument. With the attainment of the erect position, and the consequent specialisation of his limbs into hands and feet, man entered on a new phase of existence. With the advantage of manipulative organs and a progressive brain he became *Homo sapiens*, and gradually developed a capacity to understand and to utilise the forces of nature. As a handicraftsman he fashioned tools and weapons, with the skilful use of which he got the mastery over all other animals. With a knowledge of the uses of fire, the art of cooking his food, and the power of fabricating materials for clothing his body, he accommodated himself to the vicissitudes of climate, and so greatly extended his habitable area on the globe. As ages rolled on he accumulated more and more of the secrets of nature, and every such addition widened the basis for further discoveries. Thus commenced the grandest revolution the organic world has ever undergone—a revolution which culminated in the transformation of a brute into civilised man. During this long transitional period mankind encountered many difficulties, perhaps the most formidable being due to the internecine struggles of inimical members of their own species. In these circumstances the cosmic processes, formerly all-powerful so long as they acted only through the constitution of the individual, were of less potency than the acquired ingenuity and aptitude of man himself. Hence local combinations for the protection of common interests became necessary, and with the rise of social organisations the safety of the individual became merged in that of the community. The recognition of the principle of the division of labour laid the foundations of subsequent nationalities, arts, and sciences. Coincident with the rise of such institutions sprang up the germs of order, law, and ethics. The progress of humanity on these novel lines was slow, but in the main steadily upwards. No doubt the advanced centres of the various civilisations would oscillate, as they still do, from one region to another, according as some new discovery gave a preponderance of skill to one race over its opponents. Thus the civilised world of modern times came to be fashioned, the outcome of which has been the creation of a special code of social and moral laws for the protection and guidance of humanity. Obedience to its behests is virtue, and this, to use the recent words of a profound thinker, "involves a course of conduct which, in all respects, is opposed to that which leads to success in the cosmic struggle for existence. In place of ruthless self-assertion it demands self-restraint; in place of thrusting aside or treading down all competitors, it requires that the individual shall not merely respect but shall help his fellows; its influence is directed, not so much to the survival of the fittest, as to the fitting of as many as possible to survive. It repudiates the gladiatorial theory of existence. It demands that each man who enters into the enjoyment of the advantages of a polity shall be

mindful of his debt to those who have laboriously constructed it; and shall take heed that no act of his weakens the fabric in which he has been permitted to live. Laws and moral precepts are directed to the end of curbing the cosmic process and reminding the individual of his duty to the community, to the protection and influence of which he owes, if not existence itself, at least the life of something better than a brutal savage."[1]

These humble remarks will convey to your minds some idea of the scientific interest and profound human sympathies evoked by the far-reaching problems which fall to be considered in this Section. Contrasting the present state of anthropological science with its position some thirty or forty years ago, we can only marvel at the thoroughness of the change that has taken place in favour of its doctrines. Now man's immense antiquity is accepted by a vast majority of the most thoughtful men, and his place in nature, as a derivative animal at the head of the great chain of life, appeals for elucidation to all sciences and to all legitimate methods of research. But among the joyful pæans of this triumphal march we still hear some discordant notes—notes, however, which seem to me to die with their echoes, and to have as little effect on scientific progress as the whistling of an idle wind. For my own part I cannot believe that a science which seeks, in the spirit of truth, to trace the mysteries of human life and civilisation to their primary rootlets, a science which aims at purging our beliefs of superstitious figments generated in days when scientific methods were too feeble to expose the errors on which they were founded, a science which reminds us in a thousand ways that success in life depends on a correct knowledge of the cosmic forces around us, can be opposed to the highest and most durable interests of humanity.

"Lacustrine Antiquities."

An important work on "Lacustrine Antiquities" will shortly be published by the Academic Society of Vaud and the Historical Society with the assistance of the Government of the Canton. MM. B. van Muyden, President of the Historical Society, A. Colomb, Keeper of the Museum of Lausanne; and Professors F. Forel, W. Cart, and A. de Molin have been appointed a Commission to edit an album of the collections of lacustrine antiquities which form one of the principal attractions of the Archæological Museum of Lausanne.

The work will consist of about forty large 4to plates, of which five or more will be coloured, and will be sold to subscribers at the price of 30 francs stitched, or 35 francs bound. The album will be accompanied by an explanatory memoir by M. A. Colomb, the present Curator of the Museum, and is promised some time in 1894.

[1] Huxley on "Evolution and Ethics," p. 33.

Anthropology at the British Association (1893).

By GEORGE W. BLOXAM, M.A., Recorder of the Anthropological Section.

THE proceedings of the Anthropological Section of the British Association at Nottingham this year were marked by the attendance of a more than usually large number of distinguished anthropologists, and although the principal papers were chiefly of an archæological character, physical anthropology and ethnography were by no means neglected.

The work of the Section commenced as usual with an Address delivered by the President, Dr. R. Munro, who spoke on the advantages which the erect position had conferred upon man.[1] There was a large audience, and the vote of thanks, moved by Sir John Evans, and seconded by Professor Hans Hildebrand, was enthusiastically accorded.

The following is a list of the papers read before the Section:—

Professor Hans Hildebrand.—"On Anglo-Saxon Remains and Coeval Relics from Scandinavia."

J. Romilly Allen.—"On the Origin and Development of Early Christian Art in Great Britain and Ireland."

Rev. E. Jones.—"Note on an Implement of Hafted Bone, with Tooth of Hippopotamus Inserted, from Calf Hole, near Grassington."

Dr. J. H. Gladstone, F.R.S.—"On Ancient Metal Implements from Egypt and Lachish."

R. Munro, M.D.—"Notes on Flint Saws and Sickles."

J. L. Myres, M.A.—"Prehistoric Remains in Crete."

R. Munro, M.D.—"The Structures of Lake Dwellings."

Arthur Bulleid, F.S.A.—"A British Village of Marsh Dwellings."

Professor W. Boyd Dawkins, F.R.S.—"On the Place of the Lake Dwellings at Glastonbury in British Archæology."

Professor W. A. Herdman, F.R.S., and P. M. C. Kermode.—"On the Excavation of the Stone Circle of 'Lag ny Boiragh,' on the Meayll Hill, Isle of Man."

Herbert Ward.—"Ethnographical Notes relating to the Congo Tribes."

Miss M. J. Welch.—"The Primitive Americans."

The Right Rev. Dr. Bompas, Bishop of Selkirk.—"The Indians of the Mackenzie and Yukon Rivers, Canada."

Miss J. A. Fowler.—"The Australian Natives."

Lionel Decle.—"The Ma-Goa."

Lionel Decle.—"Funeral Rites and Ceremonies among the Tshinyai or Tshinyangwe."

[1] See p. 174.

Lionel Decle.—"The Arungo and Marombo Ceremonies among the Tshinyangwe."
Mrs. Lilly Grove.—"The Ethnographic Aspect of Dancing."
G. Hartwell Jones, M.A.—"The Prehistoric Evolution of Theories of Punishment, Revenge, and Atonement."
Miss A. W. Buckland.—"Four as a Sacred Number."
E. Sidney Hartland.—"Pin-wells and Rag-bushes."
R. Etheridge, jun.—"On a Modification of the Australian Aboriginal Weapon termed the Leonile, Langeel, Bendi, or Buccan."
R. Etheridge, jun.—"On an unusual form of Rush Basket from the Northern Territory of South Australia."
H. Stopes.—"The Early Uses of Flint in Polishing."
H. Stopes.—"Palæolithic Anchors, Anvils, Hammers, &c."
Francis Galton, F.R.S.—"On the Recent Introduction in the Indian Army of the method of Finger Prints for the Identification of Recruits."
J. G. Garson, M.D.—"On the External Characters of the Abyssinians examined by Mr. Bent."
Crochley Clapham, M.D.—"The Mad Head."
W. Wilberforce Smith, M.D.—"Some of the Conditions which modify Body Weight."
Professor Windle, M.D.—"Anthropometric Work in Schools."
J. Beddoe, M.D., and Dr. G. W. Leitner.—"On the Head Form of the Dards and of the Siah-Pôsh Kafirs."

Several of these papers will be read before the Institute in the course of the ensuing session, and will be printed at length in the Journal.

Abstracts of a few of the more important of the others are appended:—

Professor Hildebrand's paper "*On Anglo-Saxon Remains and Coeval Relics from Scandinavia*," was a valuable contribution to comparative archæology, and was illustrated by a beautiful series of engravings of ancient implements and ornaments of Swedish type earlier than, and coeval with, Anglo-Saxon Pagandom, together with examples of later developments.

The author explained how some of the ornaments differed in design from those of Roman and French origin, and said that the question proposed was to determine the relations which existed between the civilisation of Scandinavia and that of England during the period between the arrival of the Saxons on the English coast, and the time of their conversion to Christianity; that was roughly from the middle of the fifth to the middle of the seventh century of our era.

These limits were not exactly determinable, because both the Anglo-Saxon immigration and the spread of Christianity among the newcomers were not the work of a few years only; and pro-

gressed with very different rapidity in different parts of the country. During this period Sweden had no chronological record, and Christianity had no hold on the country until the eleventh century. The criterions of date therefore in the Scandinavian side were of a purely archæological kind. There were a few instances of Roman and Byzantine coins found associated with Scandinavian antiquities, and as these could hardly have found their way northward before the downfall of the Hunnic Empire in Central Europe, they gave some indication of the date of the objects with which they were lost or interred. In England, of course, similar date evidence occurred, but was vitiated by the fact that the coins had often evidently been long in circulation before they were buried.

The practice of burial also, while it entirely superseded cremation when Christianity became predominant, appeared to have coexisted with the older method during the later Pagan period, and could not be taken as affording an accurate criterion of age. And there was the further difficulty in comparing English and Scandinavian objects, that in England the Teutonic peoples found the British and Roman-British culture already existing on their arrival, while there was no parallel influence to modify the style of Scandinavian art.

Referring to the magnificent series of illustrations of Swedish antiquities which had been distributed among the audience, Prof. Hildebrand pointed out first the examples which by their style appeared to be of earlier date than the Saxon migration into England, and proceeded to discuss the Scandinavian types of sword and spear, which presented both remarkable likenesses and differences when compared with those which give their name to the Saxons ("sword-men"), and the Angles ("spear-men"). The boar-crest on the helmet also appeared to be a point of similarity.

Numerous examples were then adduced to show how designs borrowed from existing art were modified to suit Teutonic taste in the English series, which herein came nearer to the French and Belgian than to the Scandinavian. As illustrations of the development of style the ornamental fibulæ or brooches were of especial importance, and a number of types were cited to emphasise both the fundamental likeness and the differences in detail of the Teutonic taste in each side of the North Sea; and the gold "bracteate" ornaments, copied from Roman medals or coins, were examined in a similar way, showing how when the supply of models was cut short by the interposition of the Hunnic barrier between North and South Europe, the Teutonic craftsmen modified the Roman designs in the spirit of their native style. While the Scandinavian clay vessels present only partial likenesses with those from English sites, the glass vases which were occasionally found were almost identical in type, and seemed to have been exported from a single place of manufacture in the Rhine valley or the North of Gaul, and it was probable that the garnets which were

commonly used in the northern jewellery were similarly derived from a common source in the Carpathians.

Summing up his results, Professor Hildebrand concluded that a common Teutonic taste was the source of the art styles both of Scandinavia and of Saxon England; that the Scandinavian and Anglo-Saxon races were of closely-allied Teutonic descent, but that in the incessant movements characteristic of that stock the two branches were separated from one another, and developed independently; that the Kentish Jutes and the Saxons of England came not from Scandinavia, but from Germany; but that the case was not clear with regard to the Angles, who might possibly not be of German origin, but may have been settled at one time in the south-west corner of Scandinavia.

The object of the paper by Mr. J. Romilly Allen, "*On the Origin and Development of Early Christian Art in Great Britain and Ireland*," was to trace the various decorative elements found in early Christian art in Great Britain to their source, and to show in what way the native styles of art existing in this country at the time of the introduction of Christianity (*circa* A.D. 450) were influenced, first by the Italo-Byzantine art which came in with the importation of the illuminated MSS. used in the service of the Church, and subsequently by the coming in contact of the Anglo-Saxon and Scandinavian conquering races with the Celtic and other populations already inhabiting the British Isles. Early Christian art in this country is essentially decorative, and to a lesser extent symbolic. The conventional grouping and general treatment of the figure-subjects show that they are obviously barbarous copies of Byzantine originals. If any definite conclusions are to be arrived at with regard to the evolution of early Christian art in Great Britain, it must be by a careful examination and comparison of the minute details of the ornament. The ornament consists of the following elements:—

(1) Interlaced work (2) Key patterns (3) Step patterns (4) Spirals	Geometrical.
(5) Zoömorphic designs (6) Anthropomorphic designs (7) Phyllomorphic designs	Suggested by animal, human, and vegetable forms.

The possible sources whence each of these different patterns was derived are next to be considered. These are divided into the native or imported styles of decorative art existing in Great Britain previous to the introduction of Christianity—namely, the art of the ages of stone, bronze, and iron, and Romano-British art; and the external sources, made accessible after A.D. 450—namely, the Italo-Byzantine, Anglo-Saxon, and Scandinavian styles. The spirals are to be traced to a "late Celtic" source in the late iron age, the interlaced work and phyllomorphic designs to an Italo-Byzantine source, the step patterns possibly to a Saxon source, the

zoömorphic designs perhaps to a Scandinavian source, and the key patterns to the classical fret adapted to suit the diagonal setting-out lines usually employed in drawing early Christian ornament in Great Britain.

In the first part of his paper on "*Ancient Metal Implements from Egypt and Lachish*," Dr. Gladstone traced the gradual transition from the flint to the bronze age. He then described the composition of a number of implements found in Egypt, during the excavations conducted by Prof. Flinders Petrie, and at Lachish, an ancient Ammonite town in Syria. Some of these implements were of almost pure copper, but others were much harder and more like bronze.

The question was, from whence did the ancient Egyptians get their tin? Their knowledge of its existence was pretty well established by Prof. Petrie's discovery of a ring dating back to the 18th dynasty, or 1400 B.C., undoubtedly composed of this metal.

At Lachish there was a very high mound consisting of the ruins of successive towns. The date of the earliest (probably an Ammonite town) could not be determined, but after a series of similar towns they came to an Israelite town, and we know that the Ammonites were displaced by the Israelites, and that, in the time of Hezekiah, the Lachish of that day endured a long series of sieges by Sennacherib, and was probably destroyed by him. Right from the bottom to the top of this mound were found implements, those in the lower strata were of copper, or of copper mixed with a copper sub-oxide, while higher up in the mound were a number of bronze articles, especially arrow-heads. Not only was there a gradual change from copper to bronze, but the bronze itself gradually disappeared as the remains of the Israelite town were approached, and iron implements were found. Dr. Gladstone thought that the copper implements were hardened by allowing the oxide to be formed.

In his communication "*On the Structure of Lake Dwellings*," Dr. Munro described the various methods adopted by the lake-dwellers in the construction of the under-structures and platforms on which their huts had been placed:—

(1) *Pfahlbauten*, or pile-structures proper.

(2) Solid basements of wood, or islands made of mixed materials, crannogs, fascine structures, &c.

(3) Cellular basements of beams arranged like a log-house.

After noticing the fragmentary indications of huts collected from time to time on the sites of lake-dwellings, the author went on to describe the ruins of a cottage exposed a few years ago by peat-cutters at the Schussenried, Würtemberg. It was of a rectangular shape, measuring 33 feet long by 23 feet broad, and its walls were constructed of wooden beams plastered over with clay. Its interior was divided into two compartments, one of which contained a hearth. Dr. Munro then gave a description of an

equally important discovery recently made in Argyllshire. This was a crannog showing foundations of a circular house 32 feet in diameter, and also divided into two compartments, one of which contained a hearth and the remains of a doorway.

Mr. Arthur Bulleid described "*A British Village of Lake Dwellings*" discovered by him in March, 1892. It is situated a little more than a mile north of the town of Glastonbury, in the upper part of one of the moorland levels of Central Somerset found to the south of the Mendip Hills. The site is fourteen miles from the coast of the Bristol Channel, but only about 15 feet above high-water level. As late as 1540 the neighbouring lands were occupied either by areas of water or swamp, one mere being five miles round. The village is bounded on its east side by a natural watercourse.

There is little on the surface to indicate the site of a village, but on careful inspection between sixty and seventy low circular mounds may be seen, varying from 15 to 35 feet in diameter, and from 6 inches to 2 feet 6 inches high at the centre. These form the foundations or floors of separate dwellings, which are constructed in the following way:—On the surface of the peat is a layer or platform of timber and brushwood kept in place by numerous small piles at the margin. On this a layer of clay is placed, slightly raised at the centre, where the remains of a hearth are generally found. The dwelling itself was composed of timber filled in with wattle and daub. Not only have the wall-posts been found *in situ*, but also the entrance threshold and doorstep.

The extent of the ground covered by the sixty or seventy mounds measures more than 400 feet north and south, by 300 feet east and west. The east border of the settlement has been met with, and is well defined by a thick line of piles and timber. This side of the village was undoubtedly, to begin with, protected by water, which in course of time was replaced by an accumulation of a peaty nature. It is in and on this formation outside the settlement that many interesting structures entering into the construction of the village have been unearthed, such as banks of clay and stone, morticed timber and hurdlework. Among other things that have been discovered is a boat 17 feet long, quantities of wheel and hand-made pottery, sling stones, and bones of animals, and a great number of objects of bronze and iron, horn, bone and stone, such as fibulæ and rings, knives, saws and weapons, combs, needles, pottery stamps, and querns.

Only one pot had as yet been dug up whole, but it had been found possible to reconstruct several others from the fragments that had been discovered. From one mound alone portions of as many as ten distinct pots had been recovered. The wheel-made pottery was frequently decorated with circles, curved and flowing lines, and also with straight lines and cross hatching, the designs being in many cases beautiful and elaborate. There were distinct signs that this pottery was made by the inhabitants of the settlement, for pieces of horn had been dug up with cup-shaped

depressions cut at the top, which had no doubt been used for making the circular marks seen on the pottery.

Up to the present time nothing in the shape of a coin had been found, nor had one single fragment of Samian or Roman pottery been met with.

Whatever might be the ultimate conclusion arrived at as to the probable date of the village, and who the occupants of these dwellings might have been, they had already gained some considerable amount of knowledge of the life they lived, the discoveries proving them to have been skilful workers in metals and carpentry, and also manufactures of pottery. They also knew that they were basket makers, and acquainted with the lathe. It was obvious also from the wheat and beans, the bones of sheep and cattle, that they had tilled and farmed the adjoining highlands, and that they used the horse and dog, and lastly they were makers of fabrics, the texture of which, in some cases, they could not do otherwise than assume was in harmony with the fine and delicate fibulæ used for fastening them.

In his paper on "*Pin-wells and Rag-bushes*," Mr. E. Sidney Hartland suggested that the object of throwing pins into the water, or tying rags upon trees, was to effect union with the divinity by the perpetual contact with the god of some article identified with the worshipper. Mr. Hartland did not question the accuracy of Professor Rhys' explanation that, in certain cases, the pins were looked upon as offerings and the rags as vehicles for the transfer of disease; but he contended that the original intention was different, and that these ideas only arose after the real motive was forgotten.

In a paper "*On Anthropometric Work in Large Schools*," by Professor Windle, the author gave the results obtained in answer to a circular sent to the head masters of one hundred of the largest schools in England, Scotland, and Ireland, inquiring whether any, and if so what, anthropometric investigations were carried on in their institutions, and the methods adopted in taking the various measurements. The replies show that some form of measurement is, or has been, carried on in twenty-five schools (Table I); but they also show that the methods adopted differ considerably (Table II), a fact which greatly detracts from the value of the observations for comparative purposes.

The advantages of systematic measurements of boys from the scholastic and the scientific points of view were alluded to, and it was suggested that an endeavour should be made to encourage and systematise such work in large schools.

TABLE I.—*Measurements taken* (Number of Schools, 25).

Height	25	Length of arm ..	3	Sight	5
Weight	21	Girth „ „ ..	10	Colour-blindness ..	1
Chest girth	23	Length of forearm..	3	Hearing	1
Size of head ..	0	Girth „ „ ..	10	Lift, or Archer's pull	2

TABLE II.—*Methods of taking Measurements.*

HEIGHT.		WEIGHT.		CHEST GIRTH.	
In boots	1	In ordinary clothes .	2	In ordinary clothes	0
In gymnastic shoes	3	In gymnastic „ ..	15	In gymnastic „ ..	7
In socks	15	Naked	0	Naked	12
In bare feet ..	1	Not mentioned ..	4	Not mentioned ..	4
Not mentioned ..	5				

A very brief reference must be made to the Reports presented by the various Committees that were appointed last year:—The Report of the Anthropometric Laboratory Committee gives the results of the observations made on fifty-five males and forty-nine females who were measured during the Edinburgh meeting; and a table at the end of the report gives the corrected means of the measurements of males taken during the last three meetings of the Association, at Leeds, Cardiff, and Edinburgh. The Canon of the proportions of the body is also given, and the report enables anyone who has been measured in the laboratory to find his place with respect to the corrected mean of each measurement.

The Committee appointed to promote an Ethnographical Survey of the United Kingdom presented their First Report.

The Report is purely preliminary, but gives evidence of a vast amount of work having already been done. The Committee propose to record for certain typical villages, parishes, or places, and their vicinity:—

(1) Physical types of the inhabitants.
(2) Current traditions and beliefs.
(3) Peculiarities of dialect.
(4) Monuments and other remains of ancient culture.
(5) Historical evidence as to continuity of race.

At the end of the Report, Forms of Schedule are given which are supplied to correspondents and upon which they are requested to record their observations.

The Committee appointed to consider the question of Uniformity in the Spelling of Barbaric and Savage Languages and Race names, recommend that the system of orthography already adopted by the Royal Geographical Society, the Admiralty, the Foreign Office, the Colonial Office, the War Office, and the Government of the United States of America should be generally used in the titles of papers.

Reports were also presented by the Committee appointed to investigate the Physical Characters, Languages, and Industrial and Social Condition of the North-Western Tribes of the Dominion of Canada; the Committee for the Exploration of Ancient Remains at Aksum in Abyssinia; and the Committee on the Physical Deviations from the Normal among Children in Elementary and other Schools.

New Committees were appointed for "Anthropometric Work in Schools" and for carrying on the operations at Glastonbury.

The International Congress of Anthropology.

THE International Congress of Anthropology convened at Chicago, Monday, August 28th, held daily morning and evening sessions during the entire week, closing Saturday, September 2nd [*Science*]. All the meetings were well attended, and there was more than a full supply of excellent papers on various branches of anthropologic science, which frequently elicited animated discussion.

The session on Monday was opened by the address of the President of the Congress, Dr. Daniel G. Brinton, whose subject was "The Nation as an Element in Anthropology." It was intended to show the physical, mental, and social changes which take place when man passes from a consanguine or tribal condition of government to that which is national. This transition exerts a profound influence on the physical man through new laws of marriage and relationship, and on religion, ethics, jurisprudence and art through the extension of the intellectual horizon. The goal of such changes, the speaker predicted, will not be reached in nationalism, but in internationalism, and in the supremacy of the individual, as the only proper aim of government. The remainder of the day was taken up with the exhibition of trepanned skulls from ancient Peru, by Senor M. A. Muniz, and explanations of the anthropological laboratories of the Department of Ethnology at the Columbian Exposition, by Drs. Franz Boas, Joseph Jastrow, H. H. Donaldson and G. M. West. The latter offered a paper of great merit on the anthropometry of North American school children, and Dr. Boas one on the physical anthropology of North America, the result of very extended measurements.

Tuesday was devoted to Archæology, principally American. Mr. H. C. Mercer, however, exhibited an artificially flaked stone from the San Isidro gravels, near Madrid, Spain, exhumed by himself, and explained its probable palæolithic character. Professor G. H. Perkins read a *résumé* of archæological investigations in the Champlain Valley, and Professor Otis T. Mason described in a most interesting manner the mechanical resources invented and developed by the aboriginal toilers of the American continent. The anthropological work at the University of Michigan was sketched by Mr. Harlan J. Smith; Senor Emilio Montes entered a plea for the great antiquity of the civilisation of Peru; and Dr. Carl Lumholtz, just back from his explorations among the cave-dwellers in the Sierra Madre of Chihuahua, described their condition and exhibited specimens of their industries. The paper which attracted most attention, however, was that of Mrs. Zelia Nuttall on the Mexican calendar system, in which she presented a highly ingenious theory for the solution of this obscure and famous problem, supporting it with lengthy computations and the opinion of competent astronomers. The afternoon was spent in discussing the collection of games in the anthropological building by Dr. Stewart Culin, Captain J. G. Bourke and Mr. Frank Cushing.

The session on Wednesday was devoted to ethnology. It was

opened by a paper by the President, Dr. Daniel G. Brinton, on the alleged evidences of ancient contact between America and other continents, in which he categorically denied that any language, art, religion, myth, institution, symbol, or physical peculiarity of the American aborigines could be traced to a foreign source. Miss Alice C. Fletcher and Prof. J. C. Fillmore presented a joint study of native songs and music of great interest. Mr. Walter Hough exhibited and described bark cloth from various primitive tribes; Mr. G. A. Dorsey related a peculiar observance among the Quichua Indians of Peru; Mrs. French-Sheldon spoke of some curious customs noticed by her among the natives of East Africa; and the Rev. S. D. Peet presented a memoir on secret societies among the wild tribes. The afternoon was spent in discussing the anthropological collections in the U.S. Government Building, Professor O. T. Mason referring to an industrial exhibit based on linguistic stocks; Mr. W. H. Holmes offering a critical study of the development of flaked-stone implements; Mr. Frank Cushing giving the particulars of a curious Zuni dramatic ceremonial; and Dr. Cyrus Alder reviewing museum collections made to illustrate religious history and ceremonies.

Thursday morning was assigned to folk-lore, and papers were presented by Mr. W. W. Newell on ritual regarded as a dramatisation of myth; by Dr. Franz Boas on the ritual of the Kwakiutl Indians; by Mr. J. Walter Fewkes on Tusayan ceremonial dramatisation; and by Mr. George Kunz on the folk-lore of precious stones. The afternoon was devoted to the collections of American archæology in the anthropological building under the care of Professor F. W. Putnam, Chief of the Department, who delivered the opening address on the subject. He was followed by Mr. Frank Cushing on the "cliff-dwellers"; by Mrs. Zelia Nuttall on Mexican archæology; by Mr. G. A. Dorsey on South American archæology; and by Mr. E. Volk on cache-finds from ancient village sites in New Jersey.

"Religions" was the subject taken up on Friday morning. Dr. Morris Jastrow, Jr., began with an explanation of the method and scope of their historical study; Mrs. Sarah Y. Stevenson gave an interesting sketch of an ancient Egyptian rite illustrating a phase of primitive thought; Mrs. Matilda C. Stevenson contributed a chapter in Zuni mythology obtained by personal study on the spot; and Mr. F. Parry read a theory relating to certain elements of religious symbolism. The afternoon was given to discussion of various points in North American ethnology by Professor O. T. Mason and to the ethnology of Paraguay by Dr. Emil Hassler.

The last day, Saturday, was set apart for "Linguistics," and for reading papers which had been crowded out on previous days. Dr. Daniel G. Brinton gave a brief review of the present status of our knowledge of American languages with special reference to the parts of the continent in which it is deficient. These he especially found in Mexico and central South America. Dr. Boas stated his classification of the languages of the North Pacific coast; Dr.

C. Abel illustrated his theory of the affinities of the Egyptian and European languages; Mr. Richardson read a paper on the Cameroons of South Africa; Mr. Wildman on the ethnology of the Malay peninsula; and Dr. Jahn on the ethnological collection in the German village at the Fair. The session and the week closed with a social dinner in the Midway Plaisance given by the American to the foreign delegates, presided over by Professor F. W. Putnam and Dr. D. G. Brinton, which closed the scientific proceedings in the most agreeable manner.

All of the papers mentioned above were read before the Congress and discussed as far as time permitted. Besides these, a number were read by title from writers who could not be present. Among them were Mr. Horatio Hale, A. L. Lewis, Dr. A. F. Chamberlain, Dr. F. S. Krauss, M. Raoul de la Grasserie, Dr. F. Jacobsen, Senor C. De la Torre, and others.

The number of foreign delegates embraced a fair proportion of those present, and in this respect the Congress merited its title as an "international" one. Among them may be mentioned Dr. Carl Peters, the Imperial German Commissioner for East Africa, Senor Manuel M. de Peralta, Minister from Costa Rica, Dr. Carl Abel, the well-known Egyptologist, Mr. C. Staniland Wake, of London, Dr. A. Ernst, of Venezuela, &c.

It was decided to print at an early date the transactions of the Congress by subscription. They will form a volume of 500 pages, price $5.00, subscriptions for which may be sent to Dr. Franz Boas, Secretary, Department of Ethnology, Columbian Exposition, Chicago.

Native Inhabitants of the Philippine Islands.—The permanency of tropical temperature in the islands, however favourable for the production of sugar, hemp, tobacco, and vegetation generally, tells much even on the physique of the native inhabitants, who are mostly undersized and not too well favoured specimens of the Malay type. They are, however, when young, very docile, and make as "muchachos," or boys, very fair household servants. The natives are all called "Indios" by the Spaniards, and are, as a rule, unenterprising and indolent, unless well looked after. They never talk to their employers, and seem to be incapable of any attachment to them. They are much in the hands of the priests, and are very superstitious. Their chief sports are cock-fighting and gambling, and most of the Malay men and boys have a pet "coq de bataille," who they carry about like a baby on their arms, and whose comfort they look to before that of wife or children. Women, children, and priests smoke everywhere, and especially in the streets; a grey-haired old lady with a huge cheroot in her mouth is no uncommon object out of doors. The people are, however, clean in their habits externally. The men usually wear spotless shirts, sometimes with

embroidered fronts, and with skirts floating outside their trousers, which have at first a peculiar appearance, and the women wear clean gauzy scarves of piña over their shoulders, sometimes richly embroidered, with a bodice of the same stuff, and a long skirt of some bright stuff, with a shorter over-skirt of some black silken material. They generally go barefooted altogether. A few, however, wear socks, with "chinelas," or slippers, in fine weather, and clogs in wet weather. They carry generally black umbrellas, which serve as parasols and umbrellas at the same time, and are very fond of tawdry jewellery. The richer "mestizas" are ablaze with "strass" on holidays and feast days.

Such are the people in the towns, but there are tribes in the interior still, as I have mentioned, in a savage or half-savage state—the Igorrotes of the mountains in the west of Luzon are one tribe of these, the Negritos of the island, of evident negro origin, are another, and the Moros of Mindanao, already mentioned, who appear to be descended from the Mussulman Dyaks of Borneo. [Foreign Office Reports, Annual Series, No. 1289.]

Opium in Persia.—One hundred and three thousand, nine hundred and fifty tumans (£26,654) worth of opium was reported as dispatched, during the past year, to Kirman and Yezd and the Persian Gulf for India and China and other countries. These figures are probably far too high. A few years ago only a comparatively small quantity of opium was grown sufficient for home consumption. Now it is cultivated for exportation. At the present moment wherever there is a cultivation in Khorasan, a large portion of it is white with the poppy. The retail price now in Meshed is 9 tumans per man, or about 7*s.* per lb. There is, in fact, a great inducement to the people to cultivate opium extensively. A large portion of the population use it as a drug. They are divided into two classes; the smokers and the eaters. The former may be classed with habitual drunkards who are past redemption. There is no cure, and the opium smoker can be recognised at once by his sallow countenance, sunken cheeks, nervous gait, and, as a rule, filthy appearance. After a time he becomes unfit for employment, and is spoken of with contempt even by the opium eaters. These latter, as a rule, are middle aged and old people, and simply take one, two, or three opium pills morning and evening. When they go beyond that they soon exchange the pills for the pipe. A pill weighs one-sixhundredth of an ounce. Among the gentry of Meshed it may be said that one-fifth smoke opium, and of their servants one-fourth. Among the merchants and shopkeepers one-tenth smoke. Perhaps one-tenth of the remainder take opium pills, excluding the labouring classes, who neither smoke nor eat it. The native hakims (or doctors) recommend opium as a sovereign remedy for nearly all ailments. They follow the principles of Abu Ali Sina (Avicenna), and divide all diseases

into two classes, hot and cold, and administer a hot medicine to cure a cold complaint and *vice versâ*. It is found necessary now to give a little opium to the newly born children of confirmed opium smokers. The poppy requires very little water; once when the seed is sown, and once when the plant flowers. It also does not damage the soil and can be sown on the same ground for successive years.

It is a significant fact that two or three years ago opium had become so cheap that it hardly repaid the cultivator, and that in consequence the area cultivated began to diminish. But now merchants have begun to buy up the drug for export and to send it south: the recultivation has begun with renewed energy. [Foreign Office Reports, Annual Series, No. 1268.]

"A Survey of the Antiquarian Remains on the Island of Inismurray." By W. F. Wakeman. (Williams and Norgate, 1893.) pp. i–xxi, 1–159, 84 figs. and 8 plates. This is a very careful and well illustrated archæological survey of one of the most interesting islands in the British Archipelago, made by a distinguished Irish antiquary. Inismurray, which lies four miles off the coast of Sligo, is a veritable museum of antiquities, containing a fine cashel, or stone fort, probably of pre-Christian date; the Church of the Men; the Church of the Women; the Church of the Fire which contained, until it was destroyed, as it is said, by the Board of Works, a slab on which formerly a sacred fire perpetually burned; numerous carved crosses; altars on which are swearing stones; a couple of holed stones at which pregnant women pray; holy wells and other interesting remains, amongst which may be mentioned a sweat-house, or hot air bath. The latter is widely distributed in Ireland, and appear to be still employed in cos. Cavan and Leitrim. All the remains are described and figured, and drawings of crosses and other sculptures are given. There are numerous references to customs and beliefs, some of which must date back to pagan times. "In general the people are of a fair-headed, comely, well-built race, and they are expert, courageous boatmen." The population numbers about 100, the most common names being Brady, O'Heraghty, O'Boyle; the O'Currets have recently died out. Irish is, of course, spoken amongst themselves. The monastery was founded by St. Molaise, or Laisrén, probably about A.D. 520 or 540. In "A.D. 802 Inis-Muiredaich (as the island was then called) was burned by the foreigners" (Scandinavians). Mr. Wakeman passes very severe criticism on the "restorations" of the Irish Board of Works which is not at all too strong if his statements are correct, and judging from the action of the same Board in the Aran Islands, co. Galway, at Skellig Michael, co. Kerry, and elsewhere, there is only too good reason to believe that, from an archæological point of view,

these monuments have irreparably suffered from the "conservers" to whose care they have been entrusted. The proper maintenance of the ancient monuments of the British Islands is of such importance that the action of the Board of Works cannot be too closely watched. Attention has occasionally been drawn by archæologists to some of the performances of the Board of Works for Ireland, but with no effect, and it has now become necessary to draw the attention of others to this matter.

"**Fians, Fairies and Picts.**" By David MacRitchie. (Kegan Paul, 1893.) 8vo. pp. xxii. 77. 22 plates. The volume, an amplification of a paper read before the Folk-lore Society, discusses the origin of the tales of "fairies," and concludes that they are based on the fact that colonies of people cognate to the Lapps from time to time formed settlements, and, with their animals, were considered as supernatural by the tall natives.

"**Indian Wisdom**," or examples of the religious, philosophical, and ethical doctrines of the Hindus. With a brief history of the chief departments of Sanskrit literature, and some account of the past and present condition of India, moral and intellectual. By Sir Monier Williams. 4th edition, pp. 575. 1893. (Luzac.) The volume is "designed as much to give a summary of the history of Sanskrit literature as to present the reader with examples of certain selected portions of that literature."

"**Blackfoot Lodge Tales;**" the story of a Prairie people. By G. B. Grinnell. (Nutt, 1893.) pp. xv. and 310. "I give the Blackfoot stories as they have been told to me by the Indians themselves, not elaborating nor adding to them. In all cases except one, they were written down as they fell from the lips of the story-teller." The volume gives a most vivid idea of Indian life.

"**Pawnee Hero Stories and Folk-Tales,**" with notes on the origin, customs, and character of the Pawnee people. By G. B. Grinnell. (Nutt, 1893.) pp. 446. The stories, like those in the previous work, were taken down on the spot from the people themselves. An appendix on the language is given.

"**The Ruined Cities of Mashonaland,**" being a record of excavation and exploration in 1891. By J. T. Bent. (Longmans, 1893.) pp. 427. 8vo. The archæology, geography and ethnology of the ruins are very fully discussed, and the whole is amply illustrated.

"**The Ghost World.**" By T. F. Thiselton Dyer. (Ward and Downey, 1893.) pp. 447. 8vo. The volume contains a large amount of phantom lore from all parts of the world.

"Irish Legends and Stories." By S. Lover. (R. E. King.) pp. 386.

"An Ohio Cave Dwelling." By A. P. L. Pease. pp. 6 (plate).

"A Study of the Languages of Torres Straits." Part 1. By S. H. Ray and A. C. Haddon. pp. 153. Reprinted from "Proc. R. Irish Acad." 3rd Ser., vol. ii, No. 4.

"The Secret Commonwealth of Elves, Fauns, and Fairies," a study in Folk-lore and Psychical Research. The text by Robert Kirk, M.A., Minister of Aberfoyle, A.D. 1691. The Comment by Andrew Lang, M.A., A.D. 1893. (D. Nutt, 1893.) pp. lxv and 92. "Mr. Kirk of Aberfoyle, living among Celtic people, treats the world of faery as a mere fact in nature, a world with its own laws, which he investigates without fear of the Accuser of the Brethren. We may thus regard him even more than Wodrow, as an early student in folk-lore and in psychical research—topics which run into each other—and he shows nothing of the usual persecuting disposition."

"Origins of the Pictish Symbolism; with notes on the Sun boar, and a new reading of the Newton inscriptions." By the Earl of Southesk. (D. Douglas, 1893.) pp. 95. 4to. 11 plates. The conclusions arrived at are—"that in all probability the pillar-stone symbolism was brought into Pictavia during, or shortly before, the reign of King Nechtan, 458–482 A.D. That it was brought by a wandering band of Norsemen . . . who through superior culture and knowledge of secret mythologies, gained an influential position, perhaps as Magi . . . That . . . the symbolism . . . was used as a means of designating rank . . . That after the general adoption of Christianity, towards the end of the sixth century the symbols were continued in their secular uses . . . and that about the same period an architectural transition to cemented walls and dressed stones began . . ."

"Irish Stone Axes and Chisels." By W. J. Knowles. Reprinted from "Journal R. Soc. Antiq. Ireland." Part 2, vol. iii. 5th Series, July, 1893.

"Yoruba History, table of principal events in." By J. A. O. Payne. (Lagos.) The volume contains a valuable amount of information on local history, &c.

"Journal of the Buddhist Text Society of India." Vol. i. No. 1. "The object of this Society is to make independent research in the domain of history, philosophy, literature, and in short everything that relates to the sociological and religious institutions of India in the Buddhist period." Indian Pandits in Thibet, S'a'nti Rakshita, life of Atiśa, the Lamaic Hierarchy of

Thibet, the first Játaka. Bodhi Patha Pradípa, translated by Sarat C. Das. A brief sketch of the Bon religion of Thibet. Folk tales.

"**Journal of the Royal Statistical Society.**" Vol. lvi. Part 1. Distribution and movement of the population in India, by J. A. Baines. Results of an enquiry as to the physical and mental condition of fifty thousand children seen in one hundred and six schools, by F. Warner, M.D., F.R.C.P.

"**Belfast Naturalists' Field Club, Annual Report and Proceedings.**" 1892–93. Ser. ii. Vol. iii. Pt. 6. This energetic and thriving club interests itself with Archæology as well as with Natural History, and archæologists would do well to glance over back volumes of its Proceedings. The present number contains a fully illustrated article on "Worked Flints, Ancient and Modern," by Mr. W. Gray, who has a very extensive knowledge of Irish flint implements. There is also an account of the formation of a Committee in January last for the purpose of studying the Ethnography of Ulster in connection with the Irish Branch of the British Ethnographical Survey. Professor Haddon gave a popular lecture on the "Aran Islands; a Study in Irish Ethnography," and the following day addressed an enthusiastic meeting at which the Committee was organised, and Mr. W. H. Patterson of Garranard, Strandtown, Belfast, was elected as its secretary. The first results of this new departure are the following papers in the Proceedings:—"Some Local Folk-lore," by F. J. Bigger, Secretary to the Club (Rea's Buildings, Belfast); "Pishogues from Tipperary," by Miss L. S. Mollan; "Irish Fairies," by W. H. Patterson; "Items of Folk-lore, principally from County Down," by Mrs. Blair.

"**The American Anthropologist.**" Vol. vi. No. 2. Time keeping by light and fire, by Walter Hough. Bibliography. Vol. vi, No. 3. The last town election in Pompeii, an archæological study of Roman municipal politics based on Pompeian wall inscriptions, by J. C. Welling. Are the Maya Hieroglyphs phonetic? by Cyrus Thomas (plates). Some mythic stories of the Yuchi Indians, by A. S. Gatschet. Recent archæologic find in Arizona, by J. Mooney. Central American ceremony which suggests the snake dance of the Tusayan villagers, by J. W. Fewkes (plates). On the evolution of the art of working in stone, by J. D. McGuire (2 Figs.). Further notes on Indian child-language, by A. F. Chamberlain. Prehistoric irrigation in Arizona, by F. W. Hodge. Bibliography.

"**The American Antiquarian.**" Vol. xv, No. 4. Sculptured image, Pantaleon, Gautemala. The age of the Mound Builders, by T. L. Gaertner. Blackfoot Star Myths, by R. N. Wilson. Legend of Cumberland Mountain, by J. A. Watkins. Mounds and Relics

in Manitoba, by C. N. Bell. Man and Language, by H. Hale. Pictographs and rock paintings of the South West, by L. W. Gunckel. Ethnographic religions and ancestor worship, by S. D. Peet (illustrated).

"**The American Journal of Psychology.**" Vol. vi, No. 1. Syllabus of lectures on the psychology of pain and pleasure, by B. I. Gilman. The new life, a study of regeneration, by A. H. Daniels. The language of childhood, by F. Tracy.

"**Timehri**" (B. Guiana). Vol. vii, part 1. The Indians of Guiana, by J. J. Hartsinck, 1770 A.D. Negro folk-lore scraps.

"**Société de Borda,**" 1893. Part 1. Grammar of the dialects of the Landes. The cave of Brassempouy (illustrated). 1892. Part 4. The ancient use of salt.

"**L'Anthropologie.**" Vol. iv, No. 2. The Hak-kas (an essay on the inhabitants of the province of Canton, translated from the English of Dr. Eitel in "Notes and Queries" of Shanghai). The natives of the Soloman Islands, by Dr. A. Hagen. No. 3. The matriarchal family system of the Caucasus, by M. Kovalevsky. A contribution to the anthropology of certain races of Oceanea, by Dr. H. Ten Kate. Anthropology in the United States, by Dr. P. Topinard.

"**Bulletins de la Société d'Anthropologie de Paris.**" Vol. iii, No. 3. The Iberian race, by M. Lajard. Burial in a Dolmen at Mareuil-lès-Meaux (Seine and Marne), by M. Emile Petitot. The Canstadt skull, by Georges Hervé. The evolution of Buddhism, by Julien Vinson.

"**Revue Mensuelle de l'École d'Anthropologie de Paris.**" APRIL, 1893: The bronze age, by G. de Mortillet, 7 illustrations. MAY: On skulls from Morvan, by L. Manouvrier, 5 illustrations. JUNE: The race of "Troglodytes Magdaleniens." JULY, 1893. The dolmens of Charras (6 Figures). AUGUST. On Torques, by A. de Mortillet (10 Figures).

"**Annales de la Société d'Archéologie de Bruxelles.**" Vol. vii, No. 3. Discovery of four prehistoric stations near Bruges (plates).

"**Bulletin de la Société d'Anthropologie de Lyon.**" Vol. xi. No. 1. On papillary lines and imprints by Dr. Forgeot Anthropological researches on Transcaucasian Tartars, by E. Chantre. Origin and antiquity of the first age of iron in the Caucasus, by E. Chantre.

"**Rapport**" sur le Congrès International d'Anthropologie de Moscou. By Baron de Baye. 1893.

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OF

GREAT BRITAIN AND IRELAND.

JUNE 13TH, 1893.

J. G. GARSON, Esq., M.D., *Vice-President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The presents that had been received were announced, and thanks voted to the respective donors.

The election of CHARLES HOSE, Esq., Resident of the Baram, Sarawak, was announced, also of ALFRED PARMINTER, Esq., of Evesham, Worcester.

Dr. F. WARNER read a paper on "Deviations from the Normal among 50,000 Children."

Mr. A. L. LEWIS, Dr. L. ROBINSON, Sir H. HOWORTH, and Mr. R. PYE joined in the discussion, and the author replied.

A paper on the "Developmental Aspects of Criminal Anthropology," by Dr. CLOUSTON, was read.

Mr. OSBERT H. HOWARTH read a paper on the "Rock Inscriptions of Sinaloa," and exhibited some pottery and crania from a tomb recently opened at Xico.

Miss BUCKLAND, Mr. GOH, Mr. BALFOUR, Mr. LEWIS, Mr. PYE, Dr. GARSON, and Sir H. HOWORTH took part in the discussion.

A paper on the "Use of Narcotics by the Nicobar Islanders," by Mr. E. H. MAN, was read.

DEVIATIONS *from* NORMAL DEVELOPMENT *among* 50,000 CHILDREN. By Dr. FRANCIS WARNER, F.R.C.P.

ANTHROPOLOGICAL research has often been directed to the determination of the average growth of man in a certain class, and as a means of defining the highest types among them; this enquiry[1] was undertaken to determine the probable amount of defectiveness—or deviation from the average below the normal—in the child population, its distribution and classification, and, if possible, its significance and causation. Notes were taken only of deviations from the normal believed to be lower than the average, *i.e.*, the abnormal.

The children were seen in schools, and were each inspected by me as they stood in rank; for each case presenting any defect of body or visible defect in the nerve-system, a schedule was filled in recording particulars as to (1) Physiognomy and Development, (2) Nerve-signs indicating defective or disordered nerve-conditions, (3) Physical health and nutrition, (4) Report of teachers as to the child's work or character in school. The children presenting no visible abnormal points, and not reported as dull by the teachers, were dismissed.

A full report of the 9,186 children (Boys, 5,579; Girls, 3,607) among 50,027 (Boys, 26,884; Girls, 23,143) of whom notes were registered in schedules, has been prepared and presented to the Local Government Board. This method of inspection, as compared with the possibilities of accurate study in the laboratory, is of course somewhat incomplete, but the co-related description of Development, Nerve-state, Physical condition, and the teacher's report of each case will, I think, be found to give new information, and afford some fresh evidence as to the significance and causation of deviation from the normal type of child.

We have before us many records of the types of defect seen in the prison and the asylum, with a statement as to the frequency of individuals presenting similar conditions among the population at large, and conditions co-related. These defects among children in schools were similar in the maldevelopments seen in asylums, but usually less in degree.

Most of the signs of nerve-defect or disorder are those which I described for this purpose many years ago; their frequency and significance are now demonstrated by report and analysis.[2]

[1] This enquiry was promoted by a Joint Committee of the British Medical Association and the Charity Organisation Society.

[2] See "Mental Faculty," Cambridge University Press.

I propose in this paper to deal mainly with defects in development or proportioning in the parts of the body; a list of these points is appended giving numbers of cases seen with conditions co-related. See Table I.

All defects—with one or two exceptions—are much more frequent among boys than girls, and all are co-related with a tendency to "low nutrition," "abnormal nerve-signs," "mental dulness," but in a varying degree; it has been shown that the environment affects materially the degree of such co-relation. In the latter fact we see a practical application of the knowledge obtained by enquiry.

Cranial abnormalities form the largest group, with the highest co-relation with other defects. The group is divided into nine classes, and in each class the proportion of boys to girls is large except for "Small Heads," in which for girls the percentage upon the population is 3·2 and for boys 1·2.

Girls, when defective, are more susceptible to the environment than boys, and taking three districts in London we find the percentage of girls with small heads is, for Strand 7·0, City 6·1, Bethnal Green ·4. I cannot but think that the neighbourhood of large block buildings may be a cause of the small crania. The large heads, bosses on cranium and some other conditions, appear to be largely due to antecedent rickets.

Bosses or outgrowths in the bone are common at the site of the ossific centres of the frontal bones; usually symmetrical they often protrude considerably and strain the skin over them, so that it is frequently cut and scarred. These bosses are, however, not always symmetrical, which is one of the causes of asymmetry of the forehead; most commonly the right frontal bone develops a boss and is somewhat more prominent than the left. The whole frontal bone may be small, narrow or shallow in the vertical direction, on the other hand it may be wide and overhanging, this I think less common. I have not analysed these conditions of the forehead. A vertical frontal ridge, due to over ossification of the interparietal suture, is met with in all degrees; alone I do not know that it is important, but it may be so pronounced as to cause injury in falls, and I have seen scars over it. Accompanied by a small head and narrow forehead it forms the keeled or scaphocephalic head, well known among microcephalics, where the interparietal suture may be ridged also.

Five hydro-cephalic boys and two girls were found. Other types of cranium—such as the square, flat, and conical—were met with. The dolicho-cephalics were 43 among boys, 6 among girls, and appeared to me to be hardly abnormalities, usually being bright children.

Palate defective is only second in importance to the cranium. The palate is inspected in each child; this appears to be of essential importance, the co-relations being only slightly lower than with cranial defects. It is shown that the palate and cranium were both defective in 277 children. There were 22 cleft palates; other types are enumerated.

The external ear was frequently defective among boys. Usually the defect is similar on both sides but by no means universally. It may be abnormal in size; more important is defect in proportioning of its parts. The most important defects are absence or low formation of parts, such as the helix, and specially the antehelix, which produces an ear convex on posterior surface, cavelike in front standing out from the cranium; such ears are usually cold and blue, with slight varicosities, the skin being coarse and tightly stretched and liable to chilblain. I did not see any reason to regard the adherent lobe as very important, and do not think that arrangements of the hat in infancy have anything to do with these ill-developed, mal-proportioned ears. The condition is present more or less in seven times as many boys as girls.

Epicanthis.—A fold of skin developed across the inner angle of the opening of the eyelids is abnormal in the English race, its importance when taken alone appears very small, but in 90 children in whom it was present with cranial defect the co-related defectiveness was very high. The epicanthis appears in many children to be a temporary defect, and like depression of the nasal bones—or want of due proportional growth—to be a mal-proportion often outgrown in adolescence.

Minor conditions of defect have as a matter of convenience been grouped as "Other defects in development."

Children short or small for their age. Children were so registered whether well proportioned or not; many of these were small headed also, in which cases they were entered for the two defects as under "Cranium" and "Other defect." A small child with a well made fairly large cranium is better off than the child small in growth and with a small head, which is then more likely to be thin and dull. The nasal bones may be wide and bridge of nose sunken, as in babyhood. In some of these cases the bones appear too wide and flat, in other cases I believe it is simply an example of the ratios of infantile growth too long maintained; the proportion of boys and girls is very nearly equal.

The facial openings for eyes and mouth may be too small: I did not meet with examples of a large mouth in the schools. The palpebral fissures in the normal have their transverse axes horizontal, but they may slope downwards or upwards. The

face presents a peculiar appearance when of normal size with these openings small, a large area of featureless skin.

The forehead may be hairy, the scalp nearly joining the eyebrows at their outer margin, or its whole surface covered with fine down; usually the forehead itself is then also narrow and shallow. The face (facial bones) may be small together with the upper and lower jaw under a well made calvarium, giving the appearance of delicacy and feebleness. The soft tissue, skin and subcutaneous tissue over the bridge of the nose may be superabundant and wide, so that it feels thick when picked up with the fingers; this tends to give greater width between the eye openings. I imagine that morphologically it is associated with the epicanthis, which is often developed at the same time.

Large frontal veins, and large veins across the nose connecting the orbital veins, appeared noteworthy; they are often seen in hydrocephalus and other diseased conditions.

The prognathous type was noted in 22 cases, all boys. "Hands cold and blue" was noted, as independent of the time of year the condition is common with low development, and is usually present on one side in hemiplegic children. Ichthyosis, hare-lip, and congenital cripples were described. Supernumerary ears (in boys 7, girls 3) were represented by a papillary outgrowth in front of the tragus, sometimes nearly half an inch long and pedunculated. Occasionally there was more than one such outgrowth—I have seen three; they may be on one or on both sides: usually the ear with such appendages was well made. Branchial clefts were occasionally represented by small puncta at upper root of the helix. In three or four cases the concha was almost absent and represented by a cartilaginous outgrowth.

We may now consider the whole group of 5,851 children registered as presenting one or more of the defects referred to—these are here termed generically "Development cases." It will be a matter of interest to collect evidence as to the significance of these mal-developments, many of them slight in degree, and see if they are of any importance to the individual case or to groups of children. Are they degenerations, reversions to types common or normal in the earlier states of man, or examples of non-evolution of a uniform type in the species? The evolution of the features of man during historic periods may in part be traced from writings, also from records in marble and bronze, drawings on vases, coins and ornaments, &c. All the types of defect are seen to-day among idiots; the degree of these defects is greater among imbeciles than when the same type of defect is seen in school children. We may then judge of the amount or degree of defectiveness indicated by a condition of defect

in the body in various ways:—(1) The degree of mal-proportioning of a part, or the number of mal-proportions in it. (2) The number of parts of the body mal-proportioned. (3) The co-relations of each defect with "Low nutrition," "Abnormal nerve-signs," "Mental dulness."

Of the whole group of "Development cases" the largest proportion falls upon the boys. All these children tend to a condition of "Low nutrition" specially under conditions of home and day school life; they tend also to conditions of defect or disorder of the nerve-system, indicated by abnormal nerve-signs (or improper ratios in action of nerve-centres) and to "Mental dulness." These statements are evidenced as to the 5,851 "Development cases" and as to individual defects in the columns of Table II.

Probably some defects in development are due to the non-evolution of a perfectly uniform type in the species; this seems to be indicated by comparison of facts seen among English, Irish and Jewish children, in whom the normal type was found in 89·2 per cent. of the English, 92·5 per cent. of the Jews, and in 80 per cent. of the Irish. The Jewish children were those in the Free Schools, Whitechapel, and the Irish children were mostly near London. On the other hand defects appear to be in part due to the present environment of groups and classes of the population (removable causes).

The percentage of "development cases" is higher in schools of upper social class than among the poorer schools in every particular except "small head" and "small growth," conditions that I have dealt with elsewhere. It must be remembered that in this enquiry conditions below the average were alone recorded, so that my results do not present the average of the class, but the proportion of defectiveness; the same remark applies to questions of nationality. It seems possible that the surroundings in certain localities may have something to do with conditions of development; for this purpose I have prepared a table showing conditions of development among 34,991 children living in 20 districts in and near London. The numbers of children seen are perhaps too small for the formation of any strong opinion upon an important problem, but as there shown the conditions varied greatly.

It seems probable that there is much spontaneity in the proportional growth of children which may be largely controlled by the physical environment. Certainly this is the case as regards their nerve-system; in the infant school spontaneous movement (spontaneity of nerve-centres or "Microkinesis")[1] but little controlled by surroundings is the rule, so that fixed balances,

[1] See article in "Dictionary of Mental Science."

TABLE I.—DEVELOPMENT DEFECTS FOUND AMONG 50,027 CHILDREN (BOYS, 26,884; GIRLS, 23,143).

	No. of Cases.		Nerve-Signs.		Nutrition low.		Dull.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Cranial abnormalities	1,528	1,148	850	531	392	480	634	477
Head small..	327	738	177	372	151	399	165	353
„ large..	257	46						
Bosses on cranium..	495	127						
Forehead narrow or defective	183	78						
Frontal ridge	89	27						
Head asymmetrical	84	16	40	7	18	3	35	6
Dolicho-cephalic	43	6						
Hydrocephalus	5	2						
Other cranial types	45	4						
Palate defective	796	535	441	262	173	155	324	232
Palate narrow	450	291						
„ V-shaped	235	171						
„ arched or vaulted	86	41						
„ other types..	10	15						
„ cleft..	14	8						
External ear defect	1,047	268	566	128	196	72	340	103
Epicanthis	514	384	227	160	65	73	192	136
Other defects in development	908	645	555	355	189	172	383	263
Children small for age	209	209	119	110	88	101	78	79
Nasal bones thick or sunken	241	214	131	95	16	19	87	77
Features coarse or large	147	104	112	68	19	17	73	43
Palpebral fissures small	98	83	61	57	22	16	41	39

TABLE I.—DEVELOPMENT DEFECTS, &c.—continued.

	No. of Cases.		Nerve-Signs.		Nutrition low.		Dull.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
Other defects in development—continued.								
Mouth small	27	17	16	10	8	2	8	10
Forehead hairy	40	3						
Face small	18	11						
Bridge of nose in its soft tissue wide	33	28						
Adipose type	16	9						
Frontal veins large	13	6						
Hands blue and cold	17	11						
Prognathous type	22	0						
Ichthyosis	10	7						
Hare lip	10	5						
Congenital cripples	7	9						
"Development cases"	3,616	2,235	1,975	1,096	733	726	1,398	928
Cases of Binary defects in development	1,210	683	798	362	325	273	592	287
Cranial and "other defect"	281	219	191	121	94	95	140	95
Cranium and palate	153	124	135	64	64	57	114	56
Cranium and ear	194	44	116	18	48	22	68	19
Palate and "other defect"	142	73	88	33	34	18	74	30
Palate and ear	103	17	56	9	15	10	41	5
Palate and Epicanthis	41	33	15	18	8	8	13	13
Epicanthis and "other defect"	100	73	52	35	13	14	41	25
Epicanthis and ear	74	29	32	16	11	12	21	11
Epicanthis and cranium	46	44	41	35	18	28	37	22
Ear and "other defect"	106	27	72	13	20	9	43	11

attitudes, or postures, and average movements are not commonly seen among very young children, while in the upper standards all action is well controlled and brought up to a normal average by discipline through the eye and the ear. The problem remains why "abnormality" is so much more common with boys than girls; some facts bearing on the question seem to be proven. Defects are more common with boys than girls, but when defective in development, girls suffer most from "low nutrition" and "mental dulness," while abnormal nerve-signs are most marked among the ill-developed boys. This is seen in contrasting "development cases" in resident schools with those at home and day school, the residence increases nutrition most with the girls and the nerve-signs most with the boys. It may be that there is more spontaneity both of growth and nerve-cell action among girls than boys, and therefore more need of due impression by the environment to co-ordinate it to a normal average.

The co-relations of defective development as well as its greater frequency among boys, become accentuated when we consider cases presenting combinations of two defects, as shown in Table I.

The most frequent and nearly the most important combination is that of "Cranium and palate defective" (boys 135, girls 64), and then in order of frequency "Cranium and Ear," "Palate and Ear," "Cranium and Epicanthis," "Epicanthis and Ear," "Palate and Epicanthis."

It is in terms implying combined conditions that groups of children may best be defined and enumerated in a scientific report, while analysis of the relations of individual defects may afford the best evidence as to their causation.

If we take the percentage co-relation with mental dulness as the standard of the defectiveness of the respective groups they may be arranged thus:—

TABLE II.—CONDITIONS CO-RELATED WITH MENTAL DULNESS.

	Percentage reported dull.		
	Boys.	Girls.	Total.
50,000 children seen	8·2	6·3	7·0
Development cases	38·6	41·5	39·7
" " with abnormal nerve-signs ..	43·2	43·3	43·3
" " without nerve-signs	32·9	38·7	35·3
" " with low nutrition	39·7	39·9	39·8
" " " " " and nerve-signs	46·6	41·2	44·0

I do not wish to weary you with many figures, and will conclude with a slight reference to a group of children who appear to require special care and training numbering 817, or 16 per 1,000 upon the number seen. This includes epileptics, children defective in mental status, cripples, and children who presented defects in development with low nutrition and abnormal nerve-signs and were reported as dull in school.

A large amount of detailed information will be found in a statistical report on this investigation which has been published. An extended investigation is needed to elucidate many points here touched upon, and this work has been undertaken by a Committee appointed by the International Congress of Hygiene and Demography.

DISCUSSION.

Mr. LEWIS said he was glad, as an inhabitant of Islington, to find that parish presenting the best health average in the metropolis, notwithstanding that the two schools from which the children appeared mostly to have been selected had both, if he was not mistaken, been considered somewhat unhealthy. The children stated to belong to the City would appear to come from the outer edges of the City territory, and those said to belong to the Strand seemed to come from Seven Dials and other parts where there was no doubt much crowding, although the buildings were not so high as those in the better parts of the City and Strand districts. Some districts where crowding would not be expected (such as Croydon) appeared, however, to show a bad average. The subject was one of great difficulty but also of great practical importance, and he hoped Dr. Warner would continue his investigations into it.

Dr. ROBINSON: In the case of younger children than those dealt with in Dr. Warner's most interesting paper, I have noticed that there is a great difference in development between different children of the same age. This is markedly seen in the cutting of the teeth, and in the closing of the anterior fortanelle. I have also observed it in the growth of the limbs and in the changes taking place in the normal curves of the spine in children under three years old. These variations are usually not dependent upon environment but are hereditary. It seems, therefore, that some of the cases of defective development noticed by Dr. Warner are merely cases of delayed development depending upon idiosyncrasy. It appears to me difficult to fix a standard of normality in such organs as the ear. The ears of different children vary greatly just as do their eyes and other features, yet nearly all types may be said to be normal.

Dr. WARNER: In forming a judgment upon the abnormality or defectiveness of a cranium or feature of the body, the observer should be well accustomed to describing the normal, and must

compare the part with the normal as to size, general form, and absence of ill-proportioning of its parts. Thus: in the forehead compare its width, height, and inclination with the normal; if they be present, describe median ridge or lateral bosses—in the ear note as to their proportions the helix, antehelix, pinna, and lobe, and the texture of the cutaneous covering. As to size of the head, the standard used is to compare the head with the normal for the age, independent of the height of the child; thus a "small child" with "small head" is noted for each defect. Another mode of determining the "defectiveness" of a form of palate, ear, &c., is suggested by a table published in the report on 50,000 children where the percentage co-relation of each defect with "low nutrition," nerve disorder, and mental dulness indicates the defects in development most uniformly associated with other modes of abnormality. Thus it appears that small-headed children are at a great disadvantage in the struggle for existence, as they are very frequently delicate with nerve-disturbance and mental dulness; an ill-formed ear is a defect of less degree. Dr. Warner expressed the opinion that some so-called defects in development are reversions, sometimes even temporary in the individual as in the epicanthis which may be out-grown, while others may possibly be due in part to the conditions of the environment, markedly so when due to rickets. The distribution of defects in districts of the metropolis was presented rather as an indication as to how the investigation might be conducted than as a statement of ascertained conditions in the localities named, the work done at present being insufficient to determine so important a question. The inquiry is being actively prosecuted by a Committee appointed by the International Congress of Hygiene and Demography.

The DEVELOPMENTAL ASPECTS *of* CRIMINAL ANTHROPOLOGY.

By T. S. CLOUSTON, M.D.

THE criminal has not been studied in this country on scientific lines as he has been of late years in Italy, France and Germany. Yet three Scotsmen, Dr. J. Bruce Thomson, surgeon to Perth prison, Dr. David Nicolson, now Superintendent of the Criminal Lunatic Asylum at Broadmoor, and Dr. W. Wilson, were early in this field and did good preliminary work, apprehending the general principles that should guide investigators. Lately we have had from Dr. Ireland[1] vivid delineations of the mental and bodily peculiarities of some great criminals. Like a true scientific man and literary artist combined, he studies together

[1] Dr. Ireland: "The Blot upon the Brain," and "The Ivory Gate."

criminals, emperors and saints, subjecting them all to the same psychological analysis and the same anthropological tests. Dr. Bruce Thomson, in 1870, had come to the conclusion that "criminals form a variety of the human family quite distinct from civil and social men. There is a low type of physique, indicating a deteriorated character which gives a family likeness to them all," and he quotes with approval a friend's dictum that "the thief appears to me to be just as completely marked off from honest working people as black-faced sheep are from other breeds."[1]

He looked on criminality as being so "allied to insanity as to be chiefly a psychological study." He directed attention to the ugliness and deformities of criminals, their under size and weight, and other evidences of degeneration; to their great liability to diseases, especially to epilepsy, insanity, and brain disease, 12½ per cent. of the whole falling into these; to the shortness of their lives, and to their many psychological peculiarities. He pointed out their frequent heredity to insanity, to habitual drunkenness, and to consumption as well as to many other bodily diseases. Finally he insisted on the fixity of all their peculiarities, so that by their incurability they proved the difference between them and ordinary mankind. As Havelock Ellis says, Thomson's papers "gave a stimulus to the study of the criminal throughout Europe." Despine in France had somewhat preceded Thomson in the same field. Dr. G. Wilson at the Exeter meeting of the British Association in 1869 read a paper on "The Moral Imbecility of Habitual Criminals as exemplified by Cranial Measurement." He had measured the heads of 464 criminals, finding their average size less than that of the ordinary population, and coming to the conclusion that "the cranial deficiency is associated with real physical deterioration." Subsequently to these writers, Maudsley by his eloquent and forcible style, diffused a keener and a wider interest in the whole subject, especially among lawyers and medical men.

Since that time criminal anthropology has assumed a name and attained an importance unknown before. It fascinated Lombroso, an Italian man of genius, and through him has infected the minds of able observers in Italy and elsewhere. As Havelock Ellis says, "Lombroso first perceived the criminal as anatomicaliy and physiologically an organic anomaly. He set about weighing him, and measuring him according to the methods of anthropology. Even on the psychological side he gained new and more exact results." A Criminal Anthropological Congress was held in Paris in 1885, and other Congresses have followed. The new branch of science has journals

[1] "Journ. Ment. Science," October, 1870.

and archives devoted to its advancement. But the history, the progress, and the results of the study of criminal anthropology up to 1890 are all so admirably told by Mr. Havelock Ellis in "The Criminal," that I need only refer to that fascinating work. Few who begin to read it will lay it down again till it is finished. By its means I fully expect that the reproach of ignorance and carelessness in regard to the subject will soon be wiped out in our country; for it will certainly rouse some of our younger men to take it up. For myself, I feel it is somewhat of an impertinence to bring forward a paper on this subject at all. My excuse must be that I do so "by request," and that some recent studies of mine in regard to the nervous diseases that are apt to arise during the development of the human organism seem to have a possible relationship to one aspect of criminal anthropology. I have often directed the attention of my students and assistants to the great interest and importance of the subject; and I think the time is very near when some knowledge of it will be required of all medical men, and especially of all lawyers and the higher officials of our prisons. I trust that very soon too Bruce Thomson, Wilson and Nicolson, will have Scottish successors among its original investigators and expositors.

It is quite clear at the outset that every student of criminal anthropology must have ever before him the three great factors of:—1st, the heredity of the criminal; 2nd, his brain with its reactive and resistive qualities that may be entirely different in each case; and 3rd, his environment, with its permanent and its immediate effects. Under the heredity must be taken into account the effects of hereditary diseases, especially nervous diseases in past generations, and the fact of their possible transmutation into other diseases in offspring; the effects of privation and innutrition, of lawlessness, of hard struggles for life, of ancestral instabilities of all kinds, and of a-social conditions: while atavism and reversions of many sorts may be the key to the problem in any individual case or family. Under the brain and its essential qualities there must be considered its receptive and its reactive power, but especially its inhibitory power against pain, against "temptation," and against temporarily agreeable and disagreeable things generally. The sensibility of the organ, mentally and bodily, to pleasurable and painful impressions; and whether it is especially explosive in its mode of working; the strength of the organic cravings for food, for stimulants, for excitement, and for sexual gratification; its educability, its imitative qualities, its intellectual force, and the vividness of its power of imagination, representation and reminiscence, are all most important to be

kept in mind; as are also the moral sense and the qualities of the brain that are the basis of it; the power and natural desire to love, imitate, and admire the good, to hate the evil, to be sorry for lapses from right, and the natural strength of the social instincts in the organ.

The environment must begin with the daily life and surroundings in youth, and must go on to the education, moral and intellectual; the social, physical, and moral atmosphere breathed in youth; the motives towards good or evil presented, and how presented; the constant example of friends and companions; the direct moral and religious precepts and examples.

Those portions of the brain cortex which have mentalization as their function are unquestionably the examples of the highest evolution of organised matter to be found in nature, the fullest of hereditary qualities, the most powerful, yet the most unstable, and by far the most physiologically valuable part of man. They undoubtedly must be regarded as the vehicle of the goodness of the saint and of the badness of the criminal. Almost all the questions that arise in the study of the criminal, according to the modern school, come to these—"Have we among us men and women whose mental cortex is of such quality that in ordinary environment their conduct must necessarily be antisocial and lawless?" And if so, "what anatomical, physiological, and psychological signs are there to distinguish this criminal and his cortex?" If there are no such signs then there is no such branch of science as criminal anthropology. It will not do to say that the sole tests are the social conditions under which the criminal lives; the thing to be tested is his mental cortex, and its reaction is his lawlessness. Lombroso, Benedikt and the whole of that school say that there are tests by which the criminal may be known; that he is a criminal, potentially, long before he is one actually. Our British laws virtually deny this, and of course take no measures to meet it. There are certain kinds of criminals, the political, the occasional, the passionate, the socially high placed cheat and swindler, who are admitted by even the most enthusiastic criminologists to be indistinguishable as yet by anatomical or other signs. It is only the criminal by habit and repute, the men and women of ever recurring convictions, and the criminal who becomes so early in life, and remains so, that we practically have to do with for purposes of scientific study.

It is not my purpose in this paper to attempt to summarise the numerous and most interesting facts that have been adduced by Lombroso, Marro, Ferri, Krafft-Ebing, Broca, Benedikt and many others as to the size and shape and development of the criminal's brain, his physiognomy, his ear, his eye, and his body. One conclusion is forced on me after reading the evidence on

these points. If there is no absolutely marked criminal type that all will agree on, there can be no doubt that criminals fall far below a high or ideal anatomical and physiological standard of brain, and body and mind. All investigators are at one on this point. The weak point in criminal anthropology, it seems to me, is that while criminals have been weighed and measured, observed and described, the classes of society from which most of them come, but who have not been convicted of breaking the law, have not been observed in the same way, and the same scientific tests have not been applied to them. *A priori* there would be little use in gauging the criminal by the standard of the well-fed, the respectable and the comfortably-off classes of society. The really scientific method would be to apply the tests to whole sections of the lower labouring classes of society including the criminals. As yet, to a certain extent, criminal anthropology has been in the hands of the enthusiasts, many of whom have been fascinated by its scientific and social interest, and have seen perhaps both more and less than the men of cooler judgment who will follow them. We all know that nothing in science was seen till it was looked for, but we know also that almost anything may be seen which is expected by an enthusiast.

Looking at the subject from a social point of view there must almost necessarily be a close affinity between the habitual criminal and the habitual idler and ne'er-do-well and the able-bodied pauper. Going lower down there must be a still closer connection between him and the vagrant and the tramp; and the closest of all between him and the prostitute. Up to this there has been no very evident *pathological* nexus. But when one gets to the habitual drunkard, that element comes in along with the environment and heredity. Whatever induces it to begin with, the long continued practice of excess in drinking causes a pathological degeneration in the brain cortex that can be demonstrated by the microscope, this producing a dissolution of mental and moral inhibition, and frequently breaches of the law. There is a large class of human beings whose brains suffer manifestly and admittedly from arrested development—the congenitally imbecile. Imbecility may exist in any and every degree, and may extend to any and every mental and moral faculty. A complete idiot seems to have little connection with a criminal, but a man or a woman who is only slightly imbecile in mind has many anatomical, physiological, and psychological resemblances to him. The two conditions unquestionably overlap and intermix. Then, last of all, epilepsy and typical insanity result from a pathological change in the brain cortex, and are diseases just as much as rheumatism is a disease. Yet being diseases of the mind organ, human conduct is involved in

them, and their effects are nearly always antisocial and often lead to vice, lawlessness, and criminality. Attacks of these diseases often cause permanent damage to the brain cortex, so that afterwards the subjects of them, who have before been law-abiding men and women, become addicted to crime. A man may "recover" from attacks of epilepsy and insanity so that he is not legally insane, and he may take his place in society; yet after his attacks he may, as the result of his brain damage, become addicted to habitual drunkenness, to theft, to sexual crime, or to acts of violence which he had been entirely free from before. Therefore it seems clear that a scientific criminal anthropology which is to cover the whole ground must deal with the idle, the vagrant, the pauper, the prostitute, the drunkard, the imbecile, the epileptic, and the insane, as well as the criminal. The brain and the environment respectively play very different parts in the causation of those conditions. Society has already provided counteractive environments against the conditions of the brain cortex in the case of several of these classes—in the poorhouse, the casual ward, the reformatory, the hospital, and the pauper lunatic asylum. It would follow that if criminal anthropology established physical, hereditary, and psychological bases of much criminality, the State would have to treat many criminals from an entirely different point of view than the punitive methods hitherto applied. Such in fact is the contention of the modern school of that department of study.

Without derogating from the great and arduous labours of the modern anthropologists, any one in my department of medicine, whose daily experience is to see the human intellect and emotions entirely changed, and human conduct utterly perverted in highly developed and, in some cases, outwardly ideal human beings through subtle nutritional and dynamical changes in the brain cortex that after death exhibits no change of microscopic appearance; such a person with such daily experiences tends to attach less importance to the gross methods of anthropometry, and to visible peculiarities in the brain convolutions. Rather one depends on facial, eye and physiognomical changes and movements, because through those we get into direct contact with the outward expressions of mind. There is no type of criminal physiognomy yet established. One instinctively attaches great importance also to the proofs of diminished sensibility in criminals given by Lombroso, Marro, and Benedikt; above all, one relies on hereditary, developmental, and psychological facts to throw light on the distinctive brain qualities of the criminal. Psychometry, however, will have to be further pursued before we can fully segregate the criminal.

One physiological aspect of the criminal has not, it appears to me, obtained the observation it is worthy of. It may be called the developmental aspect. The term "degeneracy" is in the mouths of all writers on the subject since Morel's great work was written;[1] but it is clear that a degeneracy in a race or family may be a non-development in the individual. Properly speaking, the word degeneracy or degeneration as applied to a tissue or organ in an individual implies that at some former time it had been normal in constitution, like the degenerations of the cerebral cortex in extreme dementia or senility. As frequently applied in criminal anthropology it has not this sense; and when applied in the hereditary sense, it does not convey a correct meaning. It is quite clear that many criminals are so, through the environment having changed in the present generation from that of the former, though their brains are the same as their non-criminal ancestry. We all know that there are districts of the country where there are actually no criminals. It cannot be supposed that there are not in those districts persons with all Lombroso's marks of criminality, and all Benedikt's "atypical confluence" of the brain fissures. We know that when some of the inhabitants of such districts go to live in our great cities they become habitual criminals. We know also that there have been tribes of men who were all reasonably social and none of them criminal before a different race came among them with a different standard of morality and different social conditions, after which they all became drunkards and criminals together.

It seems clear to me that one of the great factors of the causation of criminality is the same as I laid down in 1889 for certain forms of insanity. If the environments and conditions of life were good, and the same in any race from generation to generation, we should have a complete adaptation of the organism to these environments. *The continual process of too sudden adaptation to new environments and new conditions that is going on in our modern life* constitutes in my opinion one of the great causational factors of criminality as I believe it does of certain forms of insanity.[2] In the course of the development of the brain I think it is a certain fact that the later years of adolescence are those in which the great inhibitory, moral, and social faculties that fit men and womenkind to live in a well ordered, modern, civil society, attain such perfection as they are capable of in most men and women. If we take the twelve years between 13 and 25 as the average period of adolescence, it is in the latter six that most criminals develop into that condition. The maximum of

[1] Morel, "Traité des Dégénérescences: Physiques, Intellectuelles et Morales."
[2] "Clinical Lectures on Mental Diseases," by the author, 3 Ed., p. 287.

criminality falls after 25. By far the greater part of the habitual criminals become so in fact before the moral and inhibitory faculties have attained full physiological perfection. The difficulties of earning a livelihood and the antisocial temptations are not then greatest. Yet the habitual thief is then developed. There is only one kind of temptations then strongest and these are connected with the sexual nisus. Looking to the psychological peculiarities of the criminal, it is very striking that they appear in most instances at the age when the moral faculties have not yet attained perfection, but in the normal man and woman are taking a special start in growth. The conclusion seems supported by many facts that most criminals become so at that period through a non-development of cerebral qualities which should then be getting normally strong in normal individuals. Most habitual criminals are never developed intellectually too in any sort of all-round way. Their reasoning power is apt to lack backbone. They stop short at the narrow intellectual range of puberty, not going on to that of full adolescence. A certain arrest occurs before the brain cortex attains its highest qualities, but after the man has attained a sort of legal responsibility. He is not technically imbecile, but such arrested brains, being subjected to the conditions and severe temptations of a highly organised modern city life, cannot exhibit qualities that they do not possess. Their owners to a large extent become the professional criminals and prostitutes of our large cities, and the tramps, idlers, paupers, and stupid unenergetic denizens of our country places. Given this quality of an undeveloped brain in its higher intellectual and moral qualities, the environment then determines the class to which it gravitates. The brain has attained almost its full size and weight, but its cells have not reached perfection in their physiological qualities, notably not in the most valuable quality of all, that of inhibition. It is a striking fact too that the early years of adolescence which immediately succeed puberty, between 13 and 18 years of age, are those in which epilepsy arises in the greatest degree; these six years producing one-third of all the cases of this disease. Now most authors are disposed to attribute epilepsy to a certain kind of diminished inhibition in the motor centres of the brain. Motor centres nearly always precede mental centres in development. The great outward likeness of the epileptic and the criminal brain is one of the most striking of Benedikt's observations.

It is in the later years of adolescence that the peculiar form of insanity incidental to this period of life is most seen, and there occur at this period also a series of lesser mental and moral changes and perversities which are unquestionably allied to criminality in all classes, and often take the form of

criminality in the lower social grades of society. They lie between insanity and criminality. Drunkenness, amounting to uncontrollable craving (dipsomania), is one marked form of this moral disturbance. They consist in some cases of stupidity and lethargy, so that the girl or lad cannot be interested in anything, especially in duty; or they consist in an a-social or antisocial development at this, normally, one of the most social of all ages; or they take the form of a causeless aversion to father, mother, sister, or brother, intolerance of control and utter disregard of duty and the ties of affection; or they take the form of general incompatibility of temper, or of impracticable visionary scheming and want of common sense; or we have sudden immoralities contrary to the bent of the former life; or perverted sexual and reproductive trains of thought dominate the mind and affect the conduct. All these mental and moral symptoms I have seen in the adolescent members of neurotic families, some of whom went through such phases of life and recovered from them as they might do from measles, and they were therefore proved to be pathological. What were "symptoms of disease" to me would certainly have been to the policeman and the magistrate evident proofs of "criminality." What were controlled and cared for in the members of a well-to-do family would probably have been neglected in a poor one. In the one instance the doctor looks after the "case," in the other the policeman locks up the "criminal"; yet they are both equally phases of the same kind of pathological brain development due to hereditary weakness.

There is a curious and in itself an unimportant change in the hard palate, which is found with such frequency in criminals in common with idiots, congenital imbeciles, epileptics, and the adolescent insane, to whom I have just referred, as compared with the general population, that it seems strongly to confirm the theory that certain criminals labour under essential defect of development of brain. As can be readily seen the hard palate has a very close relationship to the base of the anterior lobes of the brain in man. No doubt the base of the skull there follows, and is directly controlled trophically by the development of the brain that it encloses and protects. If the brain base is narrowed laterally so is the skull base, and that would imply a contraction of the hard palate which hangs from it, and is in reality an integral part of it. But why does not the palate arch in that case simply become a narrow arch of the normal form? There are two reasons against this. In the first place the palate is a part of the alimentary system, and follows the development of that rather than the nervous system. Secondly, if the brain base was arrested in growth shortly before or after birth while the palate bones

were growing fast like the rest of the alimentary system, then they would not have room for expansion, and would be thrown into a high vaulted or V-shaped arch. The palate bones continue to grow and develop normally in fact, while the skull base does not expand proportionally. If again the anterior lobes of the brain—and they are in my opinion the chief higher mental centres—do not grow in antero-posterior size, then the palate bones are confined antero-posteriorly, and we have a high deformed arch in that direction.[1] These conditions are found in every degree, shading up into the normal palate arch. I divided the palates I examined into the "Typical," the "Neurotic," and the "Deformed"; and the following table shows the results in the general population, among criminals, in the insane (acquired insanity), in epileptics, in those suffering from adolescent insanity, and in congenital imbeciles and idiots.

FREQUENCY OF THE THREE TYPES OF PALATES IN VARIOUS CLASSES OF PERSONS EXAMINED.

The different Classes of Persons.	No. 1. "Typical" palate.	No. 2. "Neurotic" palate.	No. 3. "Deformed" palate.	Number of Persons examined.
	per cent.	per cent.	per cent.	
The general population	40·5	40·5	19	604
Criminals (the degenerate)	22	43	35	286
The insane (acquired insanity) ..	23	44	33	761
Epileptics	20	43	37	44
Adolescent insanity	12	33	55	171
Idiots and imbeciles (congenital insanity)	11	28	61	169

So far as this indication goes, if indeed it is an indication, many criminals suffer from a developmental brain defect, analogous to that from which we know epileptics, the adolescent insane, and those congenitally weak-minded suffer. I look on adolescent insanity as being clearly a developmental instability due to hereditary weakness. It occurs in greatest frequency during the last stage of development of all, between 22 and 25, the mind cortex being the highest of all, and the last to attain perfection.

I have scarcely touched on the anthropology—using the word in its wide sense of the study of man in structure and function, in body and mind—of the juvenile criminal who becomes so

[1] See diagrams and photographs in "The Neuroses of Development," by the author, pp. 42, 48.

under the age of puberty. He no doubt may be a criminal by environment and by education, just as other children become diligent attenders of church or readers of good books. But there are many cases on record, and I have seen and studied several others, where this explanation will not explain all the facts, and in whom, therefore, I had to assume an original, inherent non-development of inhibition and moral faculty, where crime was truly "instinctive" and normal to the particular individual, and where no responsibility, legal or moral, could be attached to the subjects of these crimes or vices. In such cases morality does not exist because its brain basis does not exist. I have no hesitation in placing in the "developmental" anthropological species of criminals the child in an educated family about whom I am consulted, who at 7 or 8 cannot be made to see the difference between right and wrong, truth and falsehood, who steals, breaks crockery and furniture, tortures and kills animals, has not the elements of the virtues of reverence, respect, and obedience, and does all this surreptitiously and perhaps with cunning, blaming others for his transgressions, and resenting punishment as an injustice. I often see no essential difference between this child and the criminal of 11 or 12 whom I am asked by the Crown agent to visit in prison where he or she lies under the charge of deliberate murder of a little brother, or of setting fire to the house. It scarcely admits of a doubt that criminal anthropology is on a sure basis of physiological fact when it pronounces such a case a criminal through its organisation and not through its environment.

The considerations to which I have directed attention seem to point to two great sources of criminality. First, the not fully evolved man who might do his work well enough in a primitive society, but who cannot accommodate himself to the conditions of a highly organised and largely artificial modern society. Secondly, the non-developed man, whose development has been pathologically arrested towards the end of the period of adolescence, just before the inhibitory and moral faculties had attained normal strength, there being in him often a slight intellectual impairment also.

On the ROCK INSCRIPTIONS *of* SINALOA (*West Coast of Mexico*).

By O. H. HOWARTH, C.E., F.R.G.S.

THE character and surrounding features of the rock inscriptions in the Northern States of the West Coast of Mexico, seem likely to furnish an important link in the problem of the prehistoric

colonization of Central America. So far as I am aware but little attention has yet been attracted to the records of antiquity which exist in these States, owing partly to the fact that they are not distinguished by any remarkable structural remains like those which offer such extraordinary interest to the explorer in the Southern States; and partly perhaps to the fact that local reports of them are not such as to invite a laborious journey of research. While the great palaces of Palenque and Yucatan are centres of superstitious tradition, tending rather towards an exaggerated description on the part of the present inhabitants, the mere rock carvings of the North West States are not of a nature to impress the native population as being of any interest. Consequently they are not usually to be heard of or traced without somewhat persistent enquiry.

During a recent sojourn of some months in the State of Sinaloa, the result of a few such investigations—conducted only as time and opportunity allowed—has caused me no little surprise at the wealth of early records revealed one after another in a region hitherto thought to be barren of interest as compared with other parts of Central America.

With the examination of each successive group of rock inscriptions which has thus come under my notice, I have found the conviction growing upon me that here is at least a strongly suggestive argument pointing to Pacific immigration—that is, the introduction of a contingent of population from the Asiatic Continent.

I proceed first to describe shortly the character and locality of the inscriptions which I have illustrated from sketched copies, taken at points which seemed to me of the greatest importance. For the present purpose I confine myself, for reasons to be indicated presently, to the group known to the local natives as Los Labrados, from which (with a single exception) my illustrations are taken. The locality is a remarkable one in several respects; and it is necessary to describe briefly the general characteristics of the surrounding country.

The eastern boundary of the State of Sinaloa runs approximately north and south down the centre of the Sierra Madre range—here some 150 to 200 miles in width. From the foothills of the mountains a country more or less hilly slopes to the Pacific coast, and almost the whole of this country throughout the length of the State, except where occupied by villages and cultivation, is covered by a bushy jungle, not impenetrable, but remarkably uniform in growth. Several rivers flow down with a tolerably direct course from the mountains to the ocean; but as this distance does not much exceed 100 miles, they are

not of sufficient volume to be navigable, and, if not actually dry, are for the most part at a very low ebb during the dry season from October to May. The ocean shore, except where interrupted by an occasional headland or low bluff, usually presents a broad expanse of sandy beach, fringed by the bush which extends from its upper edge into the interior. At the river outlets there are frequently lagoons of great length and extent running parallel to the shore.

The mouth of the river Piaxtla, at which point I obtained the first definite information respecting the Labrados, or "worked" stones, opens into a little bay partly protected by a hilly peninsula, and employed as an anchorage and landing place for small trading schooners.

It is situated about 35 miles north of the port of Mazatlan; and excepting a small custom-house with one officer, and two or three huts occupied by Mexican Indians, the spot has no population. Southward from this point, a broad sloping beach of sand sweeps away for many miles, broken only by a single abrupt headland, which has to be crossed by riding through the bush behind it.

At a point about five miles south of this headland, and ten or eleven from the Piaxtla, I found that the beach became somewhat suddenly strewn with large boulders of a dark blue open-grained basaltic rock, possibly the terminal of some ancient lava stream, covering the whole foreshore from the edge of the bush down to the sea, and into it, and extending along the beach for a distance of about a quarter of a mile. The boulders are more or less rounded and weather-worn, and appear for the most part to be separate masses, with a bulk of probably four or five up to fifteen or twenty tons each.

Immediately on approaching these rocks I observed that a large portion of them were covered with what were at one time deeply graven figures, of great number and variety, some of which were of a type already familiar to me amongst the rock carvings up the rivers. But the occurrence of this vast series of inscribed figures, extending from the brow of the beach down to the waves, and apparently even into the sea, in a locality of such singular desolation and solitude, was far more striking than any of those I had previously seen on the river cliffs, within reach of fertile and habitable spots. Here was a complete absence of every feature that could tempt human settlement; a dreary waste of exposed and inhospitable shore, a trackless and unbroken jungle for leagues inland, and not even a sign of fresh water within ten or a dozen miles.

The figures shown on the accompanying diagrams are selected from those which remained in the best preservation,

and could be copied without uncertainty. Many of the others, according to the position or exposure of the surfaces, were more or less obliterated, especially towards the water's edge, where they have been subjected for centuries to the direct action of the wind and spray. The groove is generally of a uniform width of three-quarters to one inch, apparently cut by vertical hammering upon a sharp-pointed instrument—presumably of hard stone. The figures as shown on the diagrams are about one-half the full size. The constant variety throughout the entire series is very remarkable, considering the immense amount of labour represented; there being, so far as I was able to observe, no two figures exactly or even nearly identical. It is noticeable that there seem to be three classes of figures distinguishable, viz.:—

1. Iconographic types, in which the human or an animal form is the basis, with or without appendages of a symbolic character.
2. Detached figures of a purely ornamental order, often accurately symmetric, and also with or without similar appendages.
3. Figures possibly symbolic, but so conventionalised as strongly to suggest the idea of written letters or words, and in one or two cases, of a continuous legend.

It is hardly necessary to remark that amongst the present people of the surrounding country there is no trace whatever of any knowledge, either pretended or traditional, as to the origin of these inscriptions. The same applies to numerous other instances of similar work upon rock-faces along the course of the rivers which I examined or was told of, extending up to the mountains, and in some cases far up into the ravines of the main range.

Amongst the most remarkable of these I may mention those of the Elota river at 30 miles inland; those of Cerrito, on the same river, 15 miles inland, one of which is included, for the sake of comparison, amongst the present illustrations; those of Aguacaliente, near Soquititan, amongst the foothills; those near the mining camp of Nuestra Señora on a stream among the head waters of the Elota, almost in the heart of the Sierra Madre; and those of Siqueros on the Mazatlan river about 40 miles up. There are many more as to which my information is not yet sufficiently definite to be worth recording.

The value of these rock-writings as a key to that contingent of ancient population which spread over these coasts and valleys seems to me of a very special character. I wish now to ask attention to the particular external evidences in this case, which point more or less positively towards that theory of Pacific

immigration which has so often been broached on less cogent grounds.

In the first place it is, I believe, an ascertained fact that within historic times storm-driven vessels from the Asiatic Continent have been cast upon North American shores, and especially during that period when the trade between Japan and Spain, by way of Acapulco as an intermediate port, was not inconsiderable. This having occurred during an epoch when there is no reason for assuming that the means and conditions of navigation had materially improved, it can scarcely be argued that it did not occur at intervals in far earlier times. There is no reason for assuming that the physical conditions have materially altered. The ocean current which sweeps down from Japanese seas towards the Californian shores, and thence, rounding the point of the Lower California Peninsula, impinges upon the Mexican coast, probably, if not certainly, took the same course in the primitive ages of the human race. The prevailing north-westerly gales which traverse those seas and coasts to-day must also be assumed to have existed then. Here on the site of Los Labrados we have the evidences of long residence at a singularly uninviting portion of the coast, by a people who for some reason were induced to spend an extraordinary amount of labour in leaving a permanent record of their occupancy. If these writings are of the nature of a memorial, can any such reason be conceived stronger than that of commemorating their wreck and subsequent deliverance on the shores of a newly-discovered land? Necessity compelled them to form a settlement at the first point where their feet found a resting place after weeks or months of hopeless drifting; and this point is the very spot one would have picked out as the scene of landing of a vessel which, having escaped the rocks of Cape St. Lucas, was hurried on under stress of the known winds and currents to the mainland of Sinaloa.

We can trace these definite probabilities still further. After a long struggle for existence at a spot where cultivation was difficult and water scarce, such a people would be led to explore with caution in both directions along the coast. In doing so they would encounter the habitat of the alligator or caïman, a head of which appears carved roughly out of a projecting angle on one of the Labrados rocks. Meeting with the river outlets they would follow up the valleys where abundant water and patches of open cultivable soil would at once invite new settlement. Here they would inscribe fresh records of the same, or a more developed type than the former ones, perhaps only returning to their original colony for the purpose of adding something to the historic story of their arrival. Of

such inland records, as already noted, almost every river valley in Sinaloa affords examples.

Whether, or how soon, they here encountered the traditions and customs of the interior tribes of Mexico can scarcely yet be suggested. There is one half-obliterated fragment of an inscription on the Elota river, which I am much inclined to interpret as the Mexican Eagle and Serpent, associated with figures of the same type as those of the Labrados. But without further confirmation it is not certain that in ancient times this distinctly southern symbol had crossed the Sierra Madre so far up. The absence of such would seem further to confirm the original independence of source of the Labrados inscriptions.

A further negative evidence is the absence of all the structural and industrial remains with which research has made us familiar on the sites of the interior. A people thus cast away in a strange country would be so thrown upon the immediate resources of the spot that they would doubtless have gradually deserted it without having developed, or learned from other sources, those methods of construction or manufacture which indicate a long period of occupation. Whereas, if we assume them to have been a tribe who penetrated the mountains from the interior, or arrived at these settlements coastwise from the south, it would be difficult to account for the complete absence of the implements, weapons, pottery, clay figures, and so forth, which are so widely scattered through the interior, and in many cases were undoubtedly conveyed for long distances.

Their dwellings and implements, on the contrary, would for a long period be of the most perishable sort, and hence one would not expect to find any remains of them on these original settlements. The only relics of human occupation of any kind whatever which I could find or hear of in the neighbourhood of the Labrados were a couple of rough burial pits, in which, from the description given to me, the remains interred had evidently been burnt. This was also the case in some similar pits on the river lands near the mouth of the Piaxtla.

At the present point of this enquiry one cannot venture to lay much stress upon the internal evidences of the writings themselves, though it cannot be denied that they offer the strongest temptations to do so. Further study and comparison cannot fail to throw light on their relations with other sources, and I am convinced that a thorough examination of the Sinaloa inscriptions would yield results of more than ordinary interest. At this moment I will only quote two remarks made to me recently by Mr. Diòsy, the Secretary of the Japan Society, on looking through the sketches: "The tapered figure marked A

—probably the horse's head—is decidedly South Sea Island in character; and the ring surrounding an inner ring filled with a cross (but without the radial processes shown in the drawing) is, as a matter of fact, the Japanese crest of Satsuma."

Whatever may be the value of these suggestions, it cannot, evidently, be fully established until the identities in question are further tested. That the great majority of these figures are the result of careful design, and not of mere idle caprice, cannot be disputed if one realises the amount of persistent manual labour employed in their formation. Their peculiar situation, and the evidences of their gradual extension until they met with and became merged in characters from another source, are, in my view, a forcible argument in favour of the origin I have again ventured to suggest.

It would at least be a matter for no surprise if the present growing persuasion of the Japanese, that they can claim the former highly cultured races of Central America as an offshoot of their own ancestry, should prove to be not wholly without foundation.

Discussion.

Mr. Daigoro Goh, Hon. Secretary of the Japan Society, Chancellor, Imperial Japanese Consulate-General in London, said: It is an honour to me to be called upon to speak on the exceedingly interesting and instructive lecture just delivered by Mr. Howarth. Being quite ignorant of the subject, I have learned the subject to-night much more than I can contribute any remarks to it. So far as I could understand, Mr. Howarth has done a great deal towards the confirmation of the belief that already exists, by the additional discoveries he made in Mexico, that that country has some connection with the Asiatic countries, and in doing so he laid stress upon the rock inscriptions in Mexico shown here to-night. While I am quite ready to join him in the belief, I must say that I do not see any resemblance in those figures of the inscriptions with the prehistoric characters in Japan, known as Hibunci or sun letters, nor do I find any similarity in the Aino writing. Moreover, I should like to remind the lecturer, who said that one of the inscriptions has the crest of the Prince of Satsuma, that that identification will not give any weight on his assertion, since the former must be a thing of several thousand years old, whilst the latter has had only a seven or eight centuries' existence. There are, however, many evidences which strengthen the belief. Someone is said to have pointed out the names of places in America, such as Canada, Ohio, &c., which are strikingly Japanese; whereas the other is credited to the discovery of certain designs and badges used by the South American Indian, remarkably similar to those of the Japanese. I believe, therefore, that if the communication of Mr. Howarth's

discoveries were made to the Anthropological Society of Japan, the most valuable information we listened to to-night would be gratefully received and profitably used by them in throwing the light of research on the subject. In suggesting this, I beg to express my appreciation of the discovery of these valuable and interesting materials for science.

Mr. LEWIS thought the carving which had been considered to represent the head of a horse was much more like that of an alligator. The carvings had a general, but not, so far as he remembered, an exact resemblance to others which had been brought before them. They probably had some meaning, but he did not think they were alphabetic, or even syllabic. He hoped Mr. Howarth would supply the Institute with copies to be preserved for comparison and reference.

Mr. HOWARTH: The reason for drawing special attention to the distinction between the three classes of inscription at Los Labrados, is that they seem to afford evidence as to the original writers having gradually encountered and adopted the ideas and iconographic forms used by the inhabitants of the interior. This is especially suggested by the variation in the types of inscription one meets with by tracing and following the work of these people up the rivers, as they began to leave the coast and penetrate into the mountains. The figures based upon human or animal forms, as distinguished from the purely ornamental, and also from those partaking clearly of the character of letters, seem to reveal this gradual introduction of the recognisable types from the Mexico valley and southern interior very clearly. As to the remark made about the recurrence of the same character or letter in the inscriptions, it will be observed that even in the short continuous inscription given amongst the Labrados series of sketches, there is one distinct instance of such recurrence. The three-pronged letter with a zigzag tail is repeated in combination with other letters, but it is, nevertheless, an unmistakable repetition.

On the use of NARCOTICS *by the* NICOBAR ISLANDERS, *and certain* DEFORMATIONS *connected therewith.* By E. H. MAN.

AT previous meetings of the Institute I have had the pleasure of contributing sundry papers on the constitution and culture of the Nicobar Islanders, and in the short time at my disposal to-night I propose making a few remarks on their use of narcotics and the physical peculiarities produced thereby.

Among the numerous races of Transgangetic India and the Malayan Archipelago who intentionally stain their teeth by the constant use of betel-nut and *pán* (*Chavica betel*), without subsequently cleansing, must be included the natives of these

islands where both sexes alike indulge in this, to us, objectionable habit: in common with the Javanese, Peguans, and Kasias, mentioned by the late Sir Henry Yule,[1] they ridicule persons who allow their teeth to resemble—in respect to colour—those of dogs, monkeys, and——Bengalis (!): *shīri âm*, "like a dog," or *shīri nōt*, "like a pig," are common replies when asked what causes their dislike to clean, white teeth.[2] They affirm, moreover, that a man with white teeth would have little chance of obtaining a wife among their own people, and I have known, as an instance in point, two adult brothers at Teressa, the sons of a headman, who until their twentieth year abstained from the practice, but ultimately found themselves compelled to conform to it in order to find favour in the eyes of their sweethearts. They were both naturally good-looking and well-made specimens of their race, but their white teeth effectually barred all their prospects of connubial bliss.

Mr. Busch, writing in 1845, remarked that the excessive use of betel-nut with *pán* and quick-lime "can hardly fail to injure their health, and perhaps it may be one cause of their generally not arriving at any advanced age nor being very prolific." Present experience, however, tends to the belief that, when compared with races similarly situated, the Nicobarese are not behind the rest of mankind in respect to longevity, while, judging from the ratio of children to the adult population, the natives of Car Nicobar and Chowra may be fairly described as prolific.

The custom is regarded with favour on various grounds, namely, as improving the personal appearance, as being agreeable to the taste, as strengthening to the gums, and possibly preservative of the teeth; it is further valuable in allaying the pangs of hunger while hunting, travelling, or otherwise engaged at a distance from home or beyond the reach of provisions; others again hold that the tone of the digestive organs is thus improved, and affirm that attacks of fever are thereby mitigated, if not entirely prevented. The fact that the breath is rendered fragrant, provided the mouth is subsequently rinsed or cleansed, does not appear to enter into their consideration, nor do they imagine that the practice is beneficial in any disease except fever. It is curious to note that the habit which has so strong a hold upon them has little or no effect on the keenness of their sense of taste, or on their powers of mastication, neither does

[1] *Vide* "Journ. Anthrop. Inst.," Feb. 1880.

[2] As the black encrustation, however thick it may become, being merely vegetable matter, breaks off if left exposed, and is not found adhering to the teeth of a disinterred body, the term *shīri âm*, "like a departed spirit," is also used to describe a person who has white teeth.

it impair their general health, nor prejudicially affect their appetite for ordinary food.

The custom of betel-chewing is usually commenced by both sexes about the tenth or twelfth year, but instances are by no means rare of children of from four to six years of age who have already become addicted to it; parents, however, ordinarily discourage such infantile precocity.

The quid is usually taken the first thing in the morning, and repeated at frequent intervals during the day, so that "betel-quid-taking-period" forms one of their computations of time, and implies an interval of some fifteen minutes' duration.

At Car Nicobar and Chowra, in order to prevent an accumulation of lime and vegetable matter on and between the teeth while indulging in this practice, betel-chewers are in the habit from time to time of rubbing the outer surface of their teeth with a small plug of tobacco, which is then inserted between the upper lips and the incisors, where it is retained for subsequent similar use, and in order to impart a certain flavour to the quid, from which, however, it is kept entirely apart; this is called *kanpañ-ok-kanâp*, and is never swallowed; it is changed perhaps two or three times in the course of the day, during which period eight or ten betel-quids may be disposed of. At Teressa and Bompoka shell-lime is added to some of their leaf-tobacco and employed in the same manner.

The natives of Car Nicobar generally swallow the quid gradually after it is thoroughly chewed, but at the other islands the more common practice is to eject it. If desirous of taking a drink, or tasting some dainty, while engaged in betel-chewing, and the quid be not in a fit state to be swallowed, a Car Nicobarese will at once spit it out, but at the other islands the half-chewed quid is held in the hand and replaced as soon as the craving of the moment has been satisfied.

In the Central and Southern portions of the group the betel-nut has hitherto been largely consumed in an unripe condition, which fact, together with neglect—except among those who, from regard to their personal appearance and comfort, rub or pick the teeth, or rinse the mouth after the disposal of each quid—accounts for the extraordinary and unsightly encrustations so commonly observed on the teeth of the middle-aged and elderly members of the various communities in these islands.

The shell-lime is usually placed in a folded chavica leaf[1] with a piece of betel-nut, and the whole is crammed into the mouth;

[1] At many of the islands it is customary to break off the pointed tip of the *pán* leaf and throw it aside. The object of this is said to be no longer known, but is believed to have originated in a desire to propitiate the ever present evil spirits by an offering.

those who have loose teeth or none usually masticate the quid in a species of mortar or crusher[1] before attempting to chew it; it is also a common practice with the villagers in this portion of the group to add to the half-chewed quid a plug of tobacco to enhance the flavour of the other ingredients.[2]

Smoking is another habit which is indulged in from a very early age,[3] and several kinds of tobacco have been introduced by traders from different countries, but that which is most largely used at the present day is the Chinese variety made up in paper packets.[4] Until recently, tobacco has been cultivated only at Teressa, but an attempt is now being made to grow it also at Car Nicobar; the date of the introduction of tobacco at Teressa is unknown, but the probabilities are in favour of some period within the last hundred years, and the variety is believed to be that commonly cultivated in Burma, whence the seed was doubtless originally obtained.[5]

In those islands—notably in the Southern group—at which trade is slack and a stock of tobacco liable to be exhausted, while fresh supplies are uncertain, the natives are in the habit of eking out their slender stores of the fragrant weed by wrapping all they possess in the large leaves of the *Macaranga tanarius*, which, while well adapted for this purpose by keeping the tobacco fresh, has also the desirable property of absorbing some of the aroma, so that when emptied of their contents they in turn can be smoked *faute de mieux*.

Except in the case of cheroots received from visitors, tobacco is invariably smoked in the form of cigarettes. Although the *Nipa fruticans* flourishes in these islands, and *Areca* spathes are always easily obtainable, they are not used by the Nicobarese, as by the Malays and Burmans, for making cigarette wrappers; at the northernmost islands the skin of the *Pandanus* leaf (uncultivated variety) is used,[6] while in the Central and Southern groups respectively, the dried leaves of two plants admirably

[1] This implement has evidently been borrowed from the similar object in use among the Malays.

[2] They declare that if inserted at the same time as a fresh betel quid, nausea and giddiness are produced.

[3] Those who don't chew tobacco usually smoke the more.

[4] At Car Nicobar the generic name of all varieties is "*tabâka*."

[5] The leaf of the locally-grown tobacco is plucked in the dry season, and is suspended by the stems to strings fastened across the interior of their huts, where they are dried by the smoke sufficiently to be ready, either for smoking or chewing, in about ten days.

[6] In preparing a *Pandanus* leaf to serve as a cigarette wrapper, the women, on whom this duty devolves, first scrape both sides of the leaf several times with the blade of a knife, whereby the leaf is made pliant; after this the rolling of the tobacco in the improvised wrapper can be accomplished by either sex. The *damīat* wrapper used in the Central and Southern islands requires no such preparation, and cigarettes there are made by both sexes.

adapted for the purpose are similarly employed; the tobacco being placed in a strip of leaf, is rolled obliquely to a length of 3 to 4 inches.[1]

No other substances than those above-mentioned are chewed or smoked and there are no ceremonies connected with either habit. The shell lime for the quid is usually kept in a small coconut-shell box which, together with a packet of *Chavica* leaves and some betel-nuts, are placed in a spathe box or other receptacle: many persons now-a-days possess themselves of the ordinary lacquer box with trays which are commonly made and used in Burma for this purpose.

The betel-nut (*Areca Catechu*) is now no longer cultivated, being plentiful in all the islands, indeed in some parts the produce is so much in excess of the local requirements as to allow of a fair quantity being exported. Three varieties of the betel-leaf pepper vine are found in these islands, viz.:—*Chavica betel*, which is cultivated, and, from the fact that it was introduced into the group, is called "*akai-kaling*" (lit. the foreign betel-leaf); secondly, *Chavica macrostachya*, called "*akai-ka*," an indigenous variety which is less esteemed and is reserved chiefly for use during periods of mourning or for children when acquiring the habit; a third variety, not yet identified, is also indigenous, it is called "*akai-kēn*" (lit. "monkey-betel-nut") and is never used.

Betel-chewing, it should be added, is also in vogue among the *Shom Peň*, but whether it has been adopted—as seems most probable—in recent years since they have entered into amicable relations with the coast people, and have through their agency been able to procure shell-lime and extend the cultivation of the edible *Areca*-nut, or whether the practice dates from more remote times, is impossible at the present day to determine. They have also learnt to smoke, and I have seen youths, when supplied with a little tobacco, set to work manufacturing cigarettes for themselves.

In close connection with the practice we have been considering is a physical peculiarity resulting from it, and which amounts almost to a deformation.

In Dr. Rink's interesting sketch of his visit to the Nicobars in 1846 occurs the following passage: "the frequent use of betel and lime in the first place gives them black teeth; this they attempt to increase by rubbing: they file off the enamel and by manipulation with some kind of acid juices they produce such an effect that the teeth swell to a spongy mass, and

[1] These are known by the names *damīat* (also *taň-maiū*), *Amomum Fenzlii* (Kurz), and *kanyūa-da-fai*, the botanical name of which has not yet been ascertained.

the front teeth combine with each other. In some individuals this does not succeed, but in others the incisors are actually changed into one continuous mass which projects from the mouth because the lips cannot close on account of its large size." As nothing can at the present day be ascertained even from individuals of seventy years of age in confirmation of the above statement it is probable that Dr. Rink either obtained his information from some untrustworthy source or formed an incorrect judgment from what he himself observed in respect to the extraordinary dental encrustation, which is the result, though not the object, of the habit which conduces to its formation. To quote another authority on the Nicobars—Père Barbe: "men and women use so large a quantity of betel-nut, lime, and betel-leaves that their teeth are as black as ink, and the space between them being filled with that matter they appear as a solid piece, much like the horn invested in the mouth of the tortoise." This custom, which is confined almost entirely to the communities of the Central and Southern islands, may be, I think, attributed to the following causes:—1st, in these portions of the group the natives are not in the habit of rubbing or cleaning their teeth with a tobacco quid (*ôl-tâ-kòicha*) as is the case elsewhere; and 2ndly, they commonly eat the unripe *Areca*-nut in preference to the ripe,[1] using at the same time excessive quantities of quick-lime with every quid. It would seem, however, that increased intercourse with aliens is at the present day leading to the gradual abandonment of the custom, as is evidenced by the decrease in the number of persons who may now be seen so disfigured.

Teeth thickly encrusted in the manner above described are styled "*yēñ-kanâp*," and a period of a few weeks suffices to produce the deformation, provided that the individual desiring this disfigurement takes the betel-quid frequently, cuts up his food to avoid mastication, and carefully abstains from picking or rubbing his teeth. Only two cases of "*yēñ-kanâp*" have hitherto been observed among the *Shom Peń*, both being women, one on the east, and the other on the west, coast of Great Nicobar.

In connection with the foregoing physical peculiarities, albeit unintentionally produced, it will be of interest to note in this place certain cranial and facial deformations which are practised among the Nicobarese, but not universally or to the same extent in each community.

[1] The use of the unripe nut is universal in the Southern group, and is preferred by those in the Central group, whose teeth are not strong, and who are partial to the condition of torpor, lethargy, and semi-intoxication which is said to be produced thereby.

When exhibiting and describing some ethnological specimens from Borneo at the Anthropological Institute in December, 1885, Mr. W. M. Croker drew attention to the fact that, although the numerous tribes along the north-west coast of that large island are known to belong to one great family, singular differences are found to exist in certain of their manners and customs, and, in support of his statement, he mentioned that the practice of flattening the foreheads of children is confined to one only of these tribes. Among the Nicobarese a similar diversity of custom prevails; the natives of the Central and Southern islands (excepting the *Shom Peñ* or inland tribe) are singular among their compatriots in their adherence to the practice of cranial deformations; and in the absence of any recognized, intentional, or distinctive tribal marks, this custom, producing as it does in the majority of cases a marked difference in the shape of the profile from its natural form,[1] is in itself sufficient to enable an observer, after studying members of the Northern and Southern sections of the group, to classify them with the utmost confidence, and when on further examination other existing peculiarities in the several tribes are noted, he is able to distinguish with the like certainty the individual members of the different communities.

As the flattening of the occiput and forehead (*kōi-ta-pitâñh*) is considered of the highest importance by the communities of the Central and Southern islands, it will be well to describe the process in detail. Seated cross-legged on the floor of the hut near the hearth, the mother lays the infant—be it boy or girl—on its back across her knee, with a small pillow (*entōma-kōi*) or calico pad about 10 inches long under its head; warming her hands from time to time at the fire, or over the flame of the rude lamp, if night have set in, she gently presses the brow with the palm and out-spread fingers of both hands for an hour or more at a time, taking care the while never to exert such force as might cause the little one even momentary discomfort; the operation has, indeed, rather a soothing effect, for the child usually falls placidly asleep during the process.[2] The desired result is, of course, thus produced only by very slow degrees, and the habit is seldom abandoned until the child is old enough to run about, and accordingly resents the enforced hours of inaction and confinement to one position; the skull also is by that time (the second or third year) hardly soft enough to be

[1] The prevailing form of skull among the Nicobarese is believed to be brachycephalic. (*Vide* "Note of a Nicobarese Skull," by Prof. Flower, F.R.S., "Journ. Anthrop. Inst.")

[2] Which could hardly be the case if instruments were used, such as were exhibited by Mr. Croker, as employed by the Milanows for the like purpose.

affected by such gentle measures. The sole object of the practice is declared to be the improvement of the appearance of the person in after years; no other benefit is believed to be obtained thereby, and no evil consequences appear to ensue therefrom. From the care taken to keep the infant as much as possible on its back, whether in its mother's lap or on a cloth on the floor, the risk of unilateral deformities being produced is minimized.

As I have already remarked, this practice is confined to the inhabitants of the Central and Southern islands of the group, and the Northern islanders account for the absence of any such custom among themselves by saying that they have no sympathy with the motives or tastes which prompt their neighbours to its adoption; and it really seems as if they have the good sense to prefer that the head should retain its natural form, for, as far as can be ascertained, there are no superstitions to be found to account for their non-observance of the habit on any other ground.

In a paper contributed to the "Asiatic Researches" (vol. iii, Art. vii), Mr. N. Fontana, who visited the islands upwards of a century ago, mentions the existence of the above-named practice, and adds that among the desired objects to be attained thereby is that "the hair remains close[1] to the head as nature intended it, and the upper fore-teeth very prominent out of the mouth"; the latter portion of this statement is not confirmed by our present knowledge, for, while no effect appears to be produced on the position of the teeth by the manipulation of the skull in the manner above described, the natives concur in expressing their dislike of any undue prominence of the incisors, and evidence, in support of their assertion, the great care displayed by mothers in continually applying pressure, though of the slightest, to the upper and lower lips of their children, while engaged in their affectionate task of moulding the plastic features. As a wide mouth and prominent nose are not esteemed marks of beauty, one frequently sees mothers pressing inwards the corners of the mouth and depressing the bridge of the nose while nursing their infants.

The peculiarity in regard to the prominence of the fore-teeth which, despite the foregoing remarks, is not unfrequently to be observed in elderly members of this race, may be explained, I think, by the simple fact that, as they advance in years and become indifferent to their personal appearance, they learn to qualify the indispensable quid of betel-nut, and *Chavica* leaf

[1] The Teressa and Bompoka women train their babies' hair to grow erect on the scalp by constantly raising and combing it with the fingers, with the result that, as they usually keep it clipped, persons of both sexes are frequently to be seen at those islands with bristly wigs.

with a little quick-lime, applying the latter to the back of the upper and lower incisors with the thumb, and as it is necessary, in order to remove all traces of the lime from the thumb, that the process should be repeated two or three times in succession, and with a certain amount of pressure on each occasion, the natural effect is the gradual advancement of the fore-teeth in both jaws to such an extent, in some cases, as in conjunction with the encrustation on these teeth caused by the habit, to form an impediment to the closing of the lips.

Deformations of the trunk or limbs, *e.g.*, alteration in the form of, or hindrances to, the development of the breasts, elongation of the mammæ or of the teats, filing of the teeth,[1] amputation of part or the whole of the fingers,[2] checking the growth of the feet, castration, and in short, all forms of mutilation, are unknown among the institutions of the Nicobarese, as are also circumcision, the adoption of distinctive tribal-marks, and the almost world-wide custom of tattooing the person; though cicatrices are frequently produced through the supposed remedial process of scarifying, the practice of intentionally producing scars on any portion of the body, head, or limbs, by way of ornament, or any other reason, is likewise non-existent in these islands.

The custom so common in the adjacent peninsula—and indeed from the borders of Assam to the coasts of Borneo—of deforming the ears[3] by inserting large discs or wooden cylinders in the lobes, though in reality a deformation, is regarded by these, as well as by other, natives as an improvement on nature; though the distension of the ear-lobe in this manner is esteemed a decoration, and is adopted throughout the group, the discomfort it entails would probably have long since led to its discontinuance were it not commenced in early infancy. This practice is one of many which, in my opinion, establishes an affinity between the Nicobarese and the great Indo-Chinese family, but questions of social contact and racial affinity lie outside the scope of this paper, even had they not been dealt with by me on a previous occasion.[4]

[1] An unauthenticated statement by a young native of the Central group has been made to me to the effect that an old man who died some years ago at Nancowry, when a youth of 12, filed his upper teeth so that later on when they became encrusted they might not exceed their natural size.

[2] It follows, therefore, that no authority can be discovered for the statement on this point made by G. Hamilton concerning Car Nicobar, which he appears to have visited at the close of the last century; speaking of the practices observed on the death of a married man, he states that the widow "must conform to custom by having a joint cut off from one of her fingers."

[3] Among the *Shom Pen* the perforation of the ear-lobe is said to be undertaken when puberty is reached in either sex, in confirmation of which statement I observed a girl of about 12 with her ears unpierced.

[4] *Vide* "Journ. Anthrop. Inst.," May, 1889.

NOVEMBER 14TH, 1893.

Professor A. MACALISTER, F.R.S., *President, in the Chair.*
Afterwards, Sir WILLIAM FLOWER, K.C.B.

The Minutes of the last Meeting were read and signed.

The following elections were announced:—

E. WESTON BELL, Esq., of Belmont, Dundee.
J. E. CROMBIE, Esq., of Balgownie Lodge, Aberdeen.
Rev. T. WILTON DAVIES, of Baptist College, Nottingham.
J. L. MYRES, Esq., M.A., of Magdalen College, Oxford.
JOHN REVILLIOD, Esq., of 52, Stanhope Gardens.

The presents that had been received were announced, and thanks voted to the respective donors.

Professor BOYD DAWKINS exhibited (i) a series of specimens illustrating the manufacture of flint implements from Cissbury flint mines; (ii) a series of palæolithic implements found in one stratum in the caves of the Cresswell Crags; (iii) a series of stone implements from the Red Indian station at Trenton, New Jersey.

Professor BOYD DAWKINS read a paper on the "Relation of the Palæolithic to the Neolithic Period."

Mr. J. ALLEN BROWN, Mr. C. H. READ, Mr. A. L. LEWIS, Dr. ROBINSON, Dr. GARSON, Mr. RUDLER, and Sir WILLIAM FLOWER joined in the discussion, and the author replied.

A paper on the "Flint Implements of the Chalk Plateau of Kent," by Mr. A. M. BELL, was read.

On the RELATION *of the* PALÆOLITHIC *to the* NEOLITHIC PERIOD.

By Professor BOYD DAWKINS, M.A., F.R.S.

CONTENTS.

I. Introductory.
II. The Evidence of the Mammalia—
(*a*) Palæolithic mammalia.
(*b*) Neolithic mammalia.
III. The contrast between Palæolithic and Neolithic Faunas implies a Break.
IV. The Evidence of the Caverns.
V. The Palæolithic Period continental, the Neolithic insular in North-Western Europe.
VI. The Break in Civilisation.
VII. The alleged New Evidence as to Continuity.
VIII. The Age of the Flint-mines at Cissbury.
IX. The occurrence of Flints chipped in the Palæolithic Manner in the Refuse heaps.
X. Conclusion.

I. *Introductory.*

IN 1868 I read a paper before the International Congress of Prehistoric Archæology on the Prehistoric Mammalia of Great Britain,[1] in which the profound difference was pointed out between the Pleistocene and Prehistoric faunas, and evidence was brought forward that the one belongs to a period when Britain was continental, and the other to a period when it was insular, both in geography and climate. Since that time, in various communications to the Geological Society, in "Cave-hunting," and in "Early Man in Britain," the new facts bearing on the relation of the Pleistocene to the Prehistoric period have been analysed with the following results. They prove that the two periods are separated from each other by a revolution in climate, geography, and in animal life, and that Palæolithic man belongs to the one, and Neolithic man to the other. This conclusion has recently been traversed by Mr. J. Allen Brown, in his paper "On the continuity of the Palæolithic and Neolithic Periods."[2] "The supposed break," he writes, "in the continuity of the stone age in this country (in Britain) is bridged by the discovery of implements of later Palæolithic type, and of others which from their form may be regarded as of transition or intermediate age in some combes and dry valleys, associated with deposits of chalk and flint rubble in various parts of Sussex, as well as

[1] "Norwich Volume," 1868.
[2] "Journ. Anthrop. Inst.," xxii, 66.

with other accumulations and formations to which I shall refer as being of more recent date than the high level river drifts." The question between us is of so much importance to archæologists generally, that it is well worthy of being threshed out in the light of the newest discoveries.

I shall first of all address myself to the point as to continuity in this country. Is there any evidence that the Palæolithic shaded off into the Neolithic age *in this country* without any such break as I have mentioned above? Next I shall examine the facts bearing on the point outside the British Isles, premising that the evolution of the Neolithic from the Palæolithic stage of culture in some part of the world may be accepted as a high probability, although we may be unable to fix with precision the land where this transition took place. Into this latter question I do not propose to enter.

II. *The evidence of the Mammalia.*

We will first take the evidence, which has been accumulated during the last thirty years, as to the mammalia associated with Palæolithic and Neolithic man in various deposits in this country, and on the continent.

IIA. *Palæolithic Mammalia.*

The following mammalia occur in Great Britain in association with Palæolithic implements in the Pleistocene river-deposits and the caves, omitting the smaller and unimportant species[1]:—

	River deposits.	Caves.
Cave bear (*U. spelæus*)	..	×
Grizzly bear (*U. ferox*)	×	×
Brown bear (*U. arctos*)	×	×
Otter (*Lutra vulgaris*)	..	×
Wolf (*Canis lupus*)	×	×
Spotted hyæna (*H. spelæa*)	×	×
Wild cat (*Felis catus*)	×	×
Leopard (*F. pardus*)	..	×
Lion (*F. spelæa*)	×	×
Sabre-toothed lion (*Machairodus*)	..	×
Irish elk (*Megaceros hibernicus*)	×	×
Reindeer (*Cervus tarandus*)	×	×
Stag (*C. elaphus*)	×	×
Roe (*C. capreolus*)	×	×
Musk sheep (*Ovibos moschatus*)	×	..
Urus (*Bos primigenius*)	×	×

[1] These lists are based on the evidence published in "Cave-Hunting," pp. 360–1, and in "Quart. Geol. Journ.," xxv, p. 192; xxviii, p. 410; xxxiii, p. 607; xxxv, p. 724; xxxvi, 395–400.

	River deposits.	Caves.
Bison (*B. priscus*)	×	×
Hippopotamus (*H. amphibius*)	×	×
Wild boar (*Sus scrofa ferus*)	×	×
Horse (*Equus caballus*)	×	×
Leptorhine rhinoceros (*R. leptorhinus omus*)	×	×
Woolly rhinoceros (*R. tichorhinus*)	×	×
Straight-tusked elephant (*Elephas antiquus*)	×	..
Mammoth (*E. primigenius*)	×	×
Pouched marmot (*Spermophilus citillus*)	×	×
Lemming (*Mus lemus*)	×	×
Beaver (*Castor fiber*)	×	×

These animals inhabited South and Eastern England after the Glacial period, as Lyell and Evans point out, and their remains lie in the river deposits which have resulted from the break-up of the boulder clays; such as in the Thames and its tributaries, and in the Ouse near Bedford. In some cases, as at Hoxne in Suffolk, they also occur in strata resting on, and therefore newer than, the boulder clay. They form a part of the mammal fauna which found its way into Europe at the beginning of the Pleistocene age, and which lived on the great mass of continental land then stretching far away to the 100-fathom line in the Atlantic, before, during, and after the Glacial period. When the glacial cold was most severe the arctic mammalia, such as the musk-sheep and reindeer, advanced as far south as the Pyrenees.[1] As the climate grew milder the southern animals, such as the hippopotamus and spotted hyæna, were tempted as far north as Yorkshire. The presence of these animals in Britain in post-glacial times proves that our country then formed part of the continent of Europe, and that it was possible for the river-drift man and the cave man to follow the chase across the valley of the English Channel, from the plains of France into the forests of the south of England.[2] (Fig. 1.)

The Palæolithic mammalia in Europe, north of the Alps and Pyrenees, are identical with those in the British Isles, and the

[1] Prof. James Geikie's view that the glacial cold killed off the characteristic Pleistocene mammalia is rendered untenable by the fact that in Britain (Hoxne in Suffolk, Bedford, &c.) and in North America (Bigbone Lick, &c.) they occur in superficial strata later than the glacial period. His view also that the arctic mammalia belong to a glacial, and the southern to an interglacial age, is also negatived by the remains of the two groups lying side by side in the river deposits and caves both of Europe and America. The fact that the bones and antlers of the reindeer have been gnawed by the hyæna in most of the caves of Britain and of the Continent north of the Alps and Pyrenees, is conclusive proof that both lived in the same district at the same time, and that the one was eaten up by the other.

[2] "Early Man in Britain," chaps. v, vi, vii.

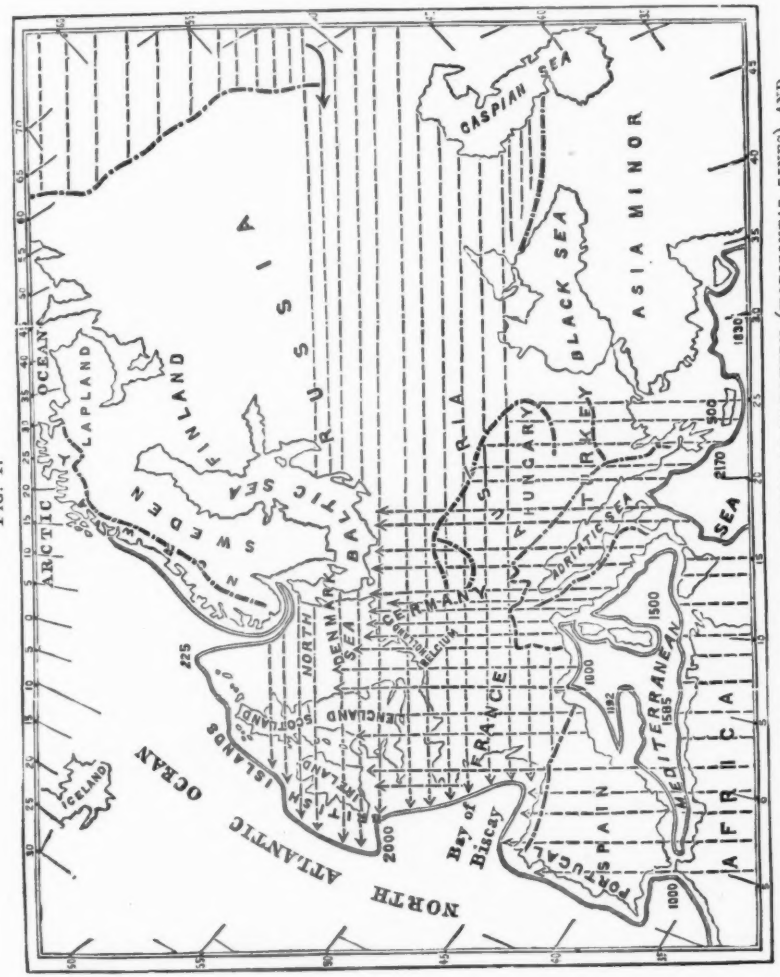

FIG. 1.

PLEISTOCENE EUROPE, SHOWING THE RANGE OF NORTHERN (HORIZONTAL LINES) AND SOUTHERN (VERTICAL LINES) MAMMALIA.

association of species, both northern and southern, is the same. To the south, however, of these mountain boundaries the northern group is conspicuous by its absence. The sub-division of the Pleistocene period into four ages, proposed by M. Ed. Lartet more than thirty years ago, has been disproved by the progress of discovery in France, Germany, and Belgium, as well as in our own country. In the river deposits, and in the caves, the species which he supposed to be characteristic of each stage are found lying together under conditions which leave no doubt as to their having lived at the same time in the same place. The gnawed and tooth-marked remains, for example, of the mammoth, the reindeer, and the bison found in the palæolithic caves of France, Germany, and Britain, leave no possibility of doubt that those three animals, supposed to characterise the three later ages, formed the daily food of the cave-hyæna, which is supposed to belong to the first.

IIB. *The Neolithic Mammalia.*

I turn now to the Neolithic mammalia in Britain, discovered in refuse heaps, in burial places, or in mines made in the search for flint for the manufacture of the higher Neolithic implements. They consist of the following species, leaving out the smaller and more unimportant forms, such as foxes and badgers.

	The Chambered Tombs of Cefn and Rhos Digre. — The Sepulchral Caves of Perthi Chawren.	Flint Mines at Grimes Graves.	Flint Mines at Cissbury.
Wild.			
Urus (*Bos primigenius*)	..	..	×
Stag (*Cervus elaphus*)	×	×	×
Roe (*C. capreolus*)	..	..	×
Wild boar (*Sus scrofa ferus*) ..	..	..	×
Horse [?] (*Equus caballus*)	×	..	×
Domestic.			
Short-horn (*Bos longifrons*) ..	×	×	×
Goat (*Capra hircus*)	×	×	×
Hog (*Sus scrofa domesticus*) ..	×	×	×
Dog (*Canis familiaris*)	×	×	×
Horse [?] (*Equus caballus*)	×	..	×

In this list of wild animals we look in vain for the larger and fiercer mammalia of the Palæolithic times, although in some of the caverns, such as those at Cresswell, and Kent's Hole, near Torquay, the Neolithic deposits are at the top and the Palæolithic are at the bottom, implying that the caverns were used as shelters during both periods. The woolly and the leptorhine rhinoceros, the mammoth, the *elephas antiquus*, the cave bear, and the sabre-toothed lion, had not merely disappeared from the face of this country before the Neolithic age, but had become extinct; and the more southern animals, such as the hippopotamus and hyæna, had passed away along with the continental and climatal conditions which rendered their sojourn in this country possible, leaving behind the ancestors of those animals which constitute the prehistoric and historic mammal fauna of Britain.

III. *The Contrast in the Faunas implies a Break.*

The mere contrast between the Palæolithic and wild Neolithic faunas implies a zoological break of the first magnitude, which could only have been brought about by a series of changes, going on through long periods of time. And this contrast is presented not merely by the results of exploration of Palæolithic and Neolithic sites in this country, but over the whole of Europe. And still more is this contrast emphasised by the arrival in this country, and in Europe generally, of the domestic animals introduced from the south and the east under the care of the Neolithic herdsman and farmer. These are without exception conspicuous by their absence from undisturbed Pleistocene deposits.

IV. *The Evidence of the Caverns.*

It is however objected that the occurrence in caves such as Cresswell, Kent's Hole, and in sundry caves on the Continent, of the Neolithic strata at the top, and the Palæolithic below, implies a continuity between the Palæolithic and Neolithic periods. (Mr. Allen Brown, *op. cit.*, pp. 82–93.) In all these, and in large numbers of other caves which have been explored during the last fifty years, in Britain and on the Continent, there is the same contrast as that indicated above between the Palæolithic and the wild Neolithic faunas. And what is much more important, the remains of the domestic animals are found *alone* in the upper Prehistoric strata. Moreover in a great many cases the lower Palæolithic strata are sealed down, and mapped off from the Neolithic, by a layer of stalagmite, sometimes of considerable thickness, which indicates, beyond all doubt, an interval of time, and a break of continuity, between the two

periods. The exploration of caverns has not, I submit, yet resulted in establishing a "continuity" but simply a sequence. It offers conclusive proof that the interval between the two was sufficiently long to bring about a change in the wild mammalia of Europe, of the same order of magnitude as that which separates the Pliocene from the Pleistocene periods.

V. *The Palæolithic Period continental, the Neolithic insular in North-Western Europe.*

The sinking of the North-Western coast line of Europe, so as to sever the British Isles from the Continent (Fig. 2), and the

FIG. 2.

NEOLITHIC BRITAIN.

sinking in the Mediterranean area, so as to isolate Europe from Africa, and to convert the mountain ranges into the islands now studding the surface of the Mediterranean sea, are, as I have elsewhere pointed out, among geographical changes which took place in this interval. On the one side of this interval you have the Palæolithic hunter, and the Palæolithic mammalia, living on a vast continent closely united with Africa, and ranging to the north-west as far as the 100-fathom line (Fig. 1); on the

other you have the Neolithic herdsman, with his domestic animals, living at a time when the geography of Europe was almost what it is now—when the sea line was almost where it is now, in the west—when the shores of Denmark were sufficiently near to the shell mounds, now dotting the coast of Jutland, to allow of Neolithic man obtaining an ample supply of shell fish from the neighbouring fiords.[1]

VI. *The Break in Civilization.*

If, however, the results as I read them, over the whole of Europe, point to the great interval dividing the Palæolithic from the Neolithic age, and to the great geographical break between them, still more shall we find these conclusions confirmed by the contrast between the Palæolithic and Neolithic civilisations. On the one hand—it is unnecessary to labour the minute details—the Palæolithic man lived by hunting the wild animals on the Pleistocene continent, armed with rude implements of stone and bone, and ignorant of all the domestic animals including the hunting dog.[2] He was a fire-using nomad, without fixed habitation. On the other hand the Neolithic man appears before us a herdsman and tiller of the ground, depending upon his domestic animals and the cultivated fruits and seeds rather than on hunting; master of the potter's art, and of the mysteries of spinning and weaving, and seeking the materials for his tools by mining. He lived in fixed habitations, and buried his dead in tombs. There is obviously a great gulf fixed between the rude hunter civilisation of the one, and the agricultural and pastoral civilisation of the other, a gulf which has not yet been bridged over by discoveries in any part of the world.

VII. *The alleged new evidence as to Continuity.*

It is alleged, however, that a continuity between the Palæolithic and Neolithic ages has been established by the flint implements scattered on the surface of the South Downs, and more particularly between Eastbourne and Newhaven. These implements, to which attention was drawn by Gen. Pitt Rivers as far back as 1868 ("Archæologia," xlii), are ploughed up in the fallows, and vary from the roughly chipped blocks to

[1] The implements, polished and rough, and the remains of the domestic *Bos longifrons*, the goat, and the dog, prove the kitchen-middens to be Neolithic.

[2] The interment in the Trou du Frontal, considered by M. Dupont to be Palæolithic, is in my opinion Neolithic. It contains skeletons, pottery, and domestic animals—the dog, goat, hog, and probably *Bos longifrons*—of well-defined Neolithic type. Dupont: "Le Temps Préhistorique en Belgique," 8vo., 1872.

the well chipped Neolithic axe. They are not found in any stratified deposit which might give a clue to their age. I submit that these waifs and strays are worthless for purposes of archæological classification. They are, however, amply represented in the refuse heaps and old mining shafts at Cissbury,[1] and Grimes Graves,[2] near Brandon, in Suffolk, and are therefore to be referred to the time when these flint mines were in active use.

VIII. *The Age of the Cissbury Flint Mines.*

What then is the age of these flint mines? Gen. Pitt Rivers in his papers on Cissbury, before the Society of Antiquaries and the Anthropological Institute, points out that there are rude implements of various Palæolithic forms in the refuse heaps. He leaves their age an open question. It may, however, be taken to be Neolithic from the following considerations.

1. That although, so far as I am aware, only two fragments of polished axes have been met with, one by Gen. Pitt Rivers, and the other by Mr. Ernest Willett and myself, numerous fragments of well known types of Neolithic axes have been discovered. (See specimens on the table.)
2. The picks of deer antler used in the workings are of the same shape as those of Grimes Graves, in which Neolithic polished stone axes were used.
3. The domestic animals used for food by the miners are those which were unknown in Europe before the Neolithic age. They were in common use in the Neolithic age and afterwards.
4. The pottery is Neolithic.[3]
5. The skeleton, found in one of the shafts, belongs to the long-headed Iberic race which inhabited Britain, and the west of Europe generally, in the Neolithic age.
6. The whole group of remains at Cissbury is of the same type as that at Grimes Graves, which is proved by Canon Greenwell to be of Neolithic age, not only from the discovery of polished stone axes in the workings, but by the cuts of the polished stone axes in the chalk walls of the passages. All these facts point to the obvious conclusion that these mines were begun and carried on in the Neolithic age.

They were probably worked during a very long period, and

[1] "Archæologia," xlii, xlv, 333. "Journ. Anthrop. Inst.," v, 357; vi, 20; vi, 430; vii, 412.
[2] "Journ. Ethnol. Soc. Lond.," ii, 419.
[3] "Journ. Anthrop. Inst.," vii, 412.

are proved by the discoveries made by Mr. Park Harrison, in 1876–7, and laid before the Institute, to have been open as late as the Prehistoric Iron age.

IX. *The occurrence of Flints chipped in the Palæolithic manner in the Refuse Heaps.*

It is, however, contended that the occurrence of flints chipped in the Palæolithic fashion is evidence that the workings go back to the Palæolithic age, and that their association with Neolithic types implies a continuity.

This, however, is met by the following consideration. Gen. Pitt Rivers pointed out, in 1866, that Cissbury was a great flint mining and manufacturing centre, in which the flint was mined and worked on the spot. In the vast accumulations of refuse, representing every stage in the chipping, from the rough block of flint fresh from the mine, to the highly finished axe, broken in the last stage of chipping by an unhappy blow, it is obvious that there must be some which would represent well-known Palæolithic types. In the series upon the table I have, among others, Mr. Brown's "Eolithic," "Palæolithic," and "Mesolithic" types.

The last (*op. cit.* Pl. III, Fig. 1) seems to me a case of the arrested development of a flint block, on its way towards the finely chipped Neolithic axe, of a type common in Southern and Eastern England. The whole of the refuse heap is composed of splinters and fragments, and wastrels rejected by the flint workers. The finished and perfect implements are as conspicuous by their absence as perfect gun-flints in a flint-knapper's yard. They have been carried off for use, and are to be sought in the Neolithic habitations and tombs. It is obvious, therefore, that the whole accumulation must be read by the light of those implements which are nearest the final stage of manufacture. And when we find among the wastrels all the Palæolithic forms, it is clear that the latter are the result of manufacture in the Neolithic age, and that they offer no proof of continuity between that age and the Palæolithic. The evidence of continuity breaks down here, as it breaks down everywhere else.

The flint mines of Cissbury and Grimes Graves, near Brandon, offer a base line for archæological research which the surface finds of the South Downs do not offer. They show that mere form is of comparatively slight importance as compared with association, and further that the implements of Palæolithic form which lie scattered over the surface of Southern England, are not necessarily of Palæolithic age; and further than this they prove that the principle of classification by form alone, by

which at the present time the range of Palæolithic man has been extended over North America, is wrong, and can only lead to erroneous conclusions.

X. *Conclusion.*

In conclusion it only remains for me to say, that, so far as I know, the progress of discovery has not yet bridged over the abyss separating the Palæolithic age of the Pleistocene period, from the Neolithic age of the Prehistoric period, in any part of the world. It is as clearly marked in India and on the Mediterranean shores of Europe, and of Asia and Africa, as it is in Britain. We must look upon mankind, with Prof. Draper, "as one man, always living and incessantly learning," but the intermediate stages, by which he passed from the Palæolithic to the Neolithic stage of civilisation, still remain to be discovered, equally with those links in evolution which connect him with the higher apes.

NOTES *on* EXHIBITS. By Professor BOYD DAWKINS.

SERIES of NEOLITHIC IMPLEMENTS from the Flint-mines of Cissbury, near Worthing, Sussex, illustrating the various stages in the manufacture of implements.

First Group.

A. Axes begun. Flint-blocks roughly chipped and simulating Palæolithic implements.
B. One side chipped.
C. Two sides chipped.
D. "Mesolithic" series.
E. Neolithic axe nearly finished, but broken.

Second Group.

A. Implement roughly blocked out, pointed at end, and simulating a Palæolithic type.
B. Implement partially chipped = chopper type.
C. Small axes roughly blocked out.
D. "Mesolithic" series.
E. Neolithic axe nearly finished, but broken.
F. Flakes and splinters.
G. Hammer stones.

It is clear from the examination of the above series that the Palæolithic and "Mesolithic" forms are merely stages in the manufacture of the true Neolithic types; and further than this, that the Palæolithic form does not necessarily imply the Palæolithic age. The confusion of the Palæolithic form into the Palæolithic age has already led to rash and hasty generalisation in the United States, and is likely to impede the progress of Prehistoric Archæology in Europe.

SERIES of PALÆOLITHIC IMPLEMENTS from the Cave-earth in the Cresswell Caves, illustrating the association of forms.

This series shows the association of the rude so-called "Eolithic" implements of the Upper Plateau gravel with well known River-drift hâches of the Amiens and Abbeville types. They were obtained from an undisturbed stratum of cave-earth which was for the most part sealed down with a layer of stalagmite. The manufacture of implements had been carried on in the caves, and the finished implements were, of course, carried off for use, or were merely represented by those which had been broken or lost.

In the making of the higher palæolithic forms, the splinters and other rude fragments of the block must preponderate in the places of manufacture, while the finished implements are carried off for use elsewhere, and are likely to be more numerous where they have been used and lost. I am therefore unable to follow Prof. Prestwich in the view that the rude implements which preponderate over the finished hâches on the surface of the High Plateau gravels, mark an earlier stage of Palæolithic culture than the River-drift stage of the Low Level gravels.

The fact that the implements in question occur only on the surface or a little below the surface of the former, while they are found in the undisturbed stratified deposits of the latter, proves in my opinion that they belong to the time of the accumulation of the latter, and that they are later than the time of the deposit of the former.

The materials out of which the implements have been fashioned, the colouring and the abrasion of their angles and edges, appear to me to be merely local accidents, and unimportant for purposes of classification. The River-drift hunter would naturally use the local materials, and the implements embedded in the surface of the clay-with-flints would naturally be stained. To my mind the whole series is of River-drift age, and represents one stage of human progress.

SERIES of IMPLEMENTS from Trenton, New Jersey, referable to the Red Indians, and illustrating the association of various types.

Group A. Indian Camping Ground.

Various implements and splinters, and finished articles, some of Palæolithic forms found on surface of plateau overlooking the river Delaware, and in association with Indian pottery. They are referable to the Delaware Indians.

Group B.

Implements found in sand of plateau, and of Palæolithic form.

Group C.

Implements from talus of old terrace of the Delaware, some of Palæolithic form.

This series of implements was obtained by me in 1880, when I spent three days in examining the district in company with Dr. Abbott, Dr. Putnam, Prof. Carvill Lewis, and Prof. Haynes. The sand in which Group B occurred seemed to me wind-drifted, and possibly rearranged in modern times.

For comparison with the above the two following specimens are exhibited :—

1. Quartzite "Teshoa," obtained by Dr. Leidy from a Shoshone squaw in Wyoming, who was using it on a hide. It is without any trace of man's handiwork.

2. Rude implement found in Soapstone Quarry worked by the Red Indians.

The question as to the existence of Palæolithic man in America depends upon the view which is taken as to the Palæolithic age of implements similar to those upon the table. Most of the observers—Abbott, Putnam, Lucien Carr, Haynes—who have studied the question on the spot, consider that the rude implements are found at such depths in the sands and gravels, as to indicate that they belong to the time of the deposit of the sands and gravels, and could not have been introduced afterwards. They view the similar implements upon the surface as having been denuded out of the strata below. If this be accepted, man lived in the area of Trenton at a time when the mastodon[1] was inhabiting the forests on the banks of the Delaware. Is it, however, quite certain that any of these implements have been found at Trenton under circumstances that would not admit of their being of later age than the sand and gravel? Looking at the evidence as to a similar deposit in

[1] A tusk was found in Trenton gravel, and is now in the museum in Brunswick City.

Minnesota, recently published by Mr. W. H. Holmes, in my opinion it is not certain. He points out that the uprooting of trees in a forest will disturb the superficial accumulation to a depth which will extend as far down as the larger roots. In this manner he satisfactorily accounts for the distribution of rude worked quartz fragments to a depth of 4 feet and more in the glacial deposits of Little Falls. (The "American Geologist," xi, 238.) This may have been the case at Trenton. The specimens obtained by me from the red sand did not occur under conditions which would render a later introduction impossible.

With regard to the specimens which came from a depth of many feet from the surface and in the gravel, Prof. Shaler is of opinion that they are not artificial, but the result of natural fracture. (The "American Geologist," xi, 183.)

On the other hand the presence of some of these implements in the old camping ground of the Indians along with ordinary Indian "shop refuse," opens up the possibility that the whole series of remains here, as at Little Falls, is really the *débris* of Indian camps. Until we have further evidence it is safe to put the Trenton rude implements to a "suspense account." The traces of Palæolithic man are, as Prof. Shaler observes, conspicuous by their absence from the caverns of Eastern North America, and from the fluviatile and lacustrine formations which contain hecatombs of the game which he would have hunted, had he been similar in his mode of life to the Palæolithic hunter in Europe.

The question of his absence or presence will have to be settled by other evidence than that of the rude form of his implements, and by a careful comparison with those of the Red Indian in America rather than with those of the River-drift man in Europe.

DISCUSSION.

Mr. J. ALLEN BROWN, while admitting the great interest of the paper, said he had not heard anything which led him to doubt the conclusions at which he had arrived, as expressed in his paper read before the Institute, to which Prof. Boyd Dawkins had referred; in fact, far from regarding the Professor's remarks as being antagonistic to his views, they appeared in several instances to confirm them. In the paper on the "Continuity of the Palæolithic and Neolithic Periods," he (the speaker) had endeavoured to show that there was a continuity of existence of man in N.W. Europe from the Plateau (or as he had suggested, the Eolithic) period to the latest division of the Stone age, and of course later. That this continuity is shown by the persistence of certain types of stone implements and by the evolution of the well known more

specialised Neolithic from the older generalised types, as well as by the evidence afforded of the gradual extinction of a few animals and the slow retreat of others.

The author's suggestion as to the Palæolithic implements from the Trenton gravels being possibly "Red Indian," he could not accept in the face of the deductions of Dr. C. Abbott and most other American geologists, but if he did so, it would only confirm his conclusions as to the persistence of some Palæolithic types in America into the latest Stone age—a continuity of form which was noticeable also in the series of native stone implements from Tasmania, recently exhibited by their late President, Dr. E. B. Tylor, accompanied with remarks of great interest and value.

It was almost unnecessary for him to say that roughness or rudeness of work was not in itself a test of age—skilled and unskilled workmen had always existed side by side, as shown in any large collection of Drift implements. It was evident from their geological position and forms that the rudely worked stones from Cresswell Crags were not of the same age as those well marked though rude implements from the Plateau Drift discovered by Mr. B. Harrison and described by Professor Prestwich.

As to general form or type there appeared to be indubitable evidence of the occurrence of dominant forms at different periods of the Stone age, and that while the later types were evolved from the earlier ones there were often survivals in later ages of older forms—as an illustration of this he called attention to the Palæolithic axe from which had gradually sprung, as shown by specimens on the table, the axes of intermediate form (Mesolithic) and the hatchets of the so-called Neolithic period.

He had never asserted that the flint implements from the mines of Cissbury were of the Palæolithic age, but had suggested that certain types of instruments survived into the period when those shafts were made, of whatever age they may be, and that such survivals of form indicated a continuity of occupation by man in this country though not necessarily by the same race. As an example of this he pointed to the large nodular pointed implement from Cissbury, on the table, which was chipped only at one end while the butt was unworked, the original crust of the nodule being preserved for comfortable use in the hand: an implement formed in this way being characteristic of the Drift period. The series of axe forms on the table appeared also to confirm his views as to the evolution of the axe which had first been shown by General Pitt Rivers in a series of lectures on "Primitive Warfare" in 1868.[1] Some of these specimens were of intermediate form, between the Drift types and those of Neolithic age, to which he had suggested that the term Mesolithic should be applied.

The flint implements alluded to in his paper on "Continuity" were not only obtained from the surface as mentioned by Professor B. Dawkins, but from chalk rubble and other deposits.

[1] "Journ. Roy. United Service Inst.," vol. xii, No. li.

There was not sufficient time in this discussion to review the most important part of the evidence, *i.e.*, that which was derived from cave deposits and rock shelters in England, France, and Belgium, referred to in his paper. Strong as was the testimony afforded by the English caves, the far richer material available to the French and Belgian geologists had brought forth overwhelming evidence in favour of his (the speaker's) conclusions, which had long since been admitted by many Continental geologists. It was sufficient to say here that he did not found his views on the French cave referred to by the author of the paper before them, or on any single cavern, but on the accumulated evidence of caves and rock shelter, &c., generally both in France and elsewhere.

As to the alleged break between the Palæolithic and so-called Neolithic periods—no physiographical or geological facts could be shown which would sustain such a theory—no cataclysmic or other action had ever been suggested which would produce such a hiatus. There was no evidence of a destructive disaster which included in its action Palæolithic man and spared the thirty-one species of mammalia which Professor Boyd Dawkins himself says survived into the Neolithic epoch, out of the forty-eight which lived in the Quaternary age—the remaining seventeen being accounted for by the migration of twelve and the extinction of five only.

Professor B. Dawkins would hardly say that the later insulation of this country, caused by the incoming of the sea over the land where is now the German Ocean, and the formation of the Straits of Dover, had anything to do with the alleged extinction of Palæolithic man in Britain, as the evidence for continuity of occupation, though not of race, was discernible on both sides of the Channel.

In considering the extinct and retreating fauna in N.W. Europe it should be remembered that there were only five extinct mammals. As the Professor had suggested the urus lived on into Neolithic times—the evidence of the survival of the reindeer in Scotland into that epoch, was strong—and the occurrence of the remains of the mammoth and some other Quaternary animals into the age of the peat-beds had been stated by eminent authorities—these slow changes had always occurred, and with the slow retreat and extinction of certain animals should be noticed the gradual increase of other Quaternary mammals in later Quaternary times: even in the historic period, the bear, wild boar, beaver and wolf had disappeared from this country—the destructive hand of man had been one of the factors in all these later changes, and the changing climate would account for the migration of other creatures: the sheep was a direct introduction from the east, probably in the earliest stage of the Bronze period, or late Stone age.

In conclusion, Mr. J. Allen Brown expressed his great satisfaction that the subject of his paper had been discussed at the Institute, and particularly that so distinguished a geologist as Professor Boyd Dawkins had given his views upon it, though he (the speaker) remained of the same opinion as he had before expressed, *i.e.*, that man had lived continuously in N.W. Europe from the most remote

period we know of, and that his advance in culture could be traced by the slow evolution and increased specialisation of his stone tools and weapons from the generalised primitive forms of the Eolithic (Plateau) and Drift periods into the later stages of the Stone age.

Professor Boyd Dawkins, in reply, said that Mr. Allen Brown had in his remarks confused continuity of *form* with continuity of *age*, and that there was no evidence in any part of the world of a continuity between the Palæolithic and Neolithic ages. There was a break, both zoological and geographical, between the two in Europe which Mr. Allen Brown had ignored.

Professor Boyd Dawkins had reserved in his paper the general question as to the derivation of the Neolithic culture from the Palæolithic in some part of the world. It had of course been so derived; but we had not yet discovered where that part is. It is probably not in Europe. With regard to the accumulation of flints in the valley bottoms, they were mostly derived from the decomposition of the chalk. In answer to Dr. Garson he stated that the chemical analysis of bones, in his opinion, was no test of age, their preservation being due to local and variable conditions. The calcareous skull he had studied at Harvard University. It is an ordinary Red Indian skull. A perforated disk of wampum in the inside is also ordinary Indian wampum. He doubted its high antiquity.

ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

An introduction to the Study of the Mammalia, living and extinct. By William Henry Flower, C.B., D.C.L., LL.D., F.R.S., &c., and Richard Lydekker, B.A., &c. (London: Adam and Charles Black, 1891.)

Man being, as regards his bodily structure, at least, essentially a member of the great group of mammalia, and subject to the same laws which govern the development and life history of the other members of the group, it is requisite that the anthropologist, in order to enable him to study his subject to advantage, should possess a knowledge of vertebrate anatomy generally, and especially of that of the mammalia. Hence the appearance of this new work on the mammalia by Sir William Flower and Mr. Lydekker has a special interest in relation to anthropology. The want of a modern English manual, treating not only of the skeleton and its modifications in the different living and extinct mammalia, but which also contains a description of the anatomical characters of the soft parts of the body, has been felt of recent years by anthropologists, and is, we think, now supplied by this work, so far as can be done within the limits of an introductory study of the mammalia.

In the first chapter the general characters of the mammalia, the development of their young, their size, and their uses and products are briefly described. The next chapter deals with their general anatomical characters, arranged under seven headings—namely, tegumentary structures, including the hair, colour, scales, nails, claws, hoofs, and odour-secreting glands; the dental system; the skeleton; the digestive system; the circulatory, absorbent, respiratory, and urinary systems; the nervous system and organs of sense; and lastly, the reproductive organs. Although the chapter extends to seventy-four pages, the description of these different systems of the body is as much condensed as possible. A desire to keep this part of the work within due limits probably accounts for the absence of any section on the developmental history of the mammal and its various systems, although a subject of the utmost importance in a general account of its anatomy, and necessary even to understand the description given subsequently; as, for example, we notice that two of the embryonic layers are referred to in the account of the development of the teeth, but, without a pre-

vious knowledge of general embryonal development, such references would not be intelligible to the reader. The authors have apparently presupposed such knowledge, and have also assumed some previous knowledge of vertebrate anatomy on his part, as we notice in the description of the thigh and leg the terms pre-axial and postaxial are used, without explanation, regarding the primitive and unmodified positions of the tibia and fibula.

The third chapter deals with the origin and classification of the mammalia. The view taken of their origin, namely, that they have all come from the same ancestral stock at the time the amphibian type was passing into the reptilian, will probably be accepted generally by zoologists, notwithstanding the diversity of opinions which exist as to details. The portion of the chapter dealing with the classification of the mammalia is very important, being the key to the arrangement of the subsequent part of the work. It is frankly admitted by the authors that all attempts to form a classification, embracing living as well as extinct specimens already known, must be of a temporary and provisional nature owing to the changes of ideas consequent upon our rapidly advancing knowledge of extinct forms. Whatever means may hereafter be taken to express the natural relationships of the various groups of the mammalia, it is certain that in systematic descriptions and catalogues, and probably also in the arrangements of specimens in museums, a linear series, though necessarily artificial and arbitrary, must ever be followed. The vast experience of Sir William Flower in museum work, as well as his universally admitted knowledge especially of this particular class of the animal kingdom, gives great weight to the arrangement which he here proposes, and to the reasons set forth which have led him to adopt it. Doubtless, as he states, "equally good reasons might be given for almost any other combination of the various elements of which the series is composed," but it may be assumed that the arrangement he has adopted is the outcome of much careful consideration of all sides of the question, as well as mature experience, and may therefore be accepted, without hesitation, as the most convenient classification for practical purposes, of this important class of animals. Adopting Huxley's three sub-classes of the mammalia of prototheria, metatheria, and eutheria, the prototheria are divided into the monotremata and a group of extinct animals termed multituberculata; the metatheria include one order, the marsupialia, and are subdivided into two sub-orders and twelve families. These sub-classes being well defined, give little trouble. It is to the arrangement of the different animals of the third sub-class, eutheria, that most people will look with interest. Space, however, prevents us from doing more than mention them in the order in which they are placed—namely, edentata, sirenia, cetacea, ungulata, rodentia, carnivora, insectivora, chiroptera, and primates.

The fourth chapter is devoted to the geographical and geological distribution of mammals. The division of the globe into six zoological regions proposed by Mr. P. L. Sclater has been

followed, and a sketch is given of the chief mammalian types characteristic of each. In dealing with the distribution of aquatic mammals, we are glad to observe that the "right" whale of the North Atlantic, *Balæna atlantica*, *B. australis* of the South Seas, and *B. japonica* of the North Pacific, all of which show no differences in anatomical structure or external appearances, are considered to be but one species and not three as they are usually made, for no better reason apparently than because they are found in regions of the ocean very widely separated. In regard to the appearance of mammals in geological time, the earliest date at which they are at present known to exist, is in the upper part of the Triassic period which forms the base of the Mesozoic epoch, these mammals, as we have seen, are placed with the sub-class prototheria, but it is not till the Eocene period of the Tertiary epoch that the earliest known eutheria are found, though probably in some part of the world they had made their appearance before that period.

In the fifth and succeeding chapters to the end of the book, the various orders of the mammalia are dealt with more in detail, the plan adopted being to give first a general description of the chief characters of each order, and then to deal with the families and genera which are included under it. In many instances also certain of the better known, or more interesting members of a group, are described at some length, while the others are treated with greater brevity. Readers of a journal devoted to anthropology, as this is, will naturally be most interested in the last chapter, which deals with the primates, and particularly with that part of it which treats of the family *Hominidæ*. For this reason we propose to devote the rest of our remarks to that section of the work.

The primates are divided into two sub-orders, the *Lemuroidea* and the *Anthropoidea*, the former consisting of the lemurs, tarsier, and aye-aye, while the latter includes the remaining members of the order—namely, those animals commonly known as marmosets, monkeys, baboons, and apes, together with man himself, and is divided into five families. The general description of the families of the *Anthropoidea* will be found extremely useful by anthropologists as containing a comparative survey of the anatomical characters of the group and the variations which occur in it. In treating of the families individually, the *Hapalidæ* and *Cebidæ*, which are confined in their geographical distribution to the New World, are dealt with more cursorily than the *Cercopithecidæ* and *Simiadæ* which contain better known species, and have special interest in relation to man, such as the baboons, gibbons, orang-utan, gorilla, and chimpanzee. In going through the higher forms of apes, one is painfully struck with the absence of extinct species, *Pliopithecus* and *Dryopithecus*, from the middle Miocene of France, and *Anthropopithecus sivalensis*, from the Pliocene of the Punjab, being the only representatives known to us. As the countries which are the habitats of the higher apes become

better known to us, it is sincerely to be hoped that some of the intermediate forms which have at one time existed will be discovered.

Since man differs from the apes most resembling him in bodily structure less than some of the other universally acknowledged members of the group do from one another, and as zoological classification has never taken into consideration the psychological characters of animals, but only their tangible and physical structure, he must be included amongst the primates. The authors consider the best exposition of the order as we now know it, is to regard man as representing a fifth family of the *Anthropoidea*, though this does not imply that such families are equivalent to one another, or that the intervals by which they are separated are of equal importance; all that the authors commit themselves to is that "there are five perfectly distinct groups, all branches from a common stem, and, in the present state of nature, not united by any intermediate types."

"The distinctions between the *Hominidæ* and the *Simiadæ* are chiefly relative, being greater size of brain and of brain-case as compared with the facial portion of the skull, smaller development of the canine teeth of the males, complete adaptation of the structure of the vertebral column to the vertical position, greater length of the lower as compared with the upper extremities, and greater length of the hallux with complete absence of the power of bringing it in opposition to the other four toes."

Man, as now universally admitted, is considered as a single genus, and reasons conclusive, to our mind, are adduced why he should be also considered a single species in the ordinary sense in which the word is now used, and all his different modifications regarded only as varieties or races, they never having been so far separated as not to be able to recombine and so answer to the physiological definition of species. There is ample proof to hand to show that vast antiquity must be assumed for man, during which he has been influenced by the operation of those natural laws which have produced the variations seen in other regions of organic nature. The first men may, very probably, have been all alike, but when spread over the earth and subject to diverse external conditions, racial differences began slowly to be developed. Geographical position and isolation must have been one of the chief elements in determining the formation and permanence of races, not only as regards their physical type but also their intellectual and moral qualities. "Thus for untold ages the history of man has represented a shifting kaleidoscopic scene; new races gradually becoming differentiated out of the old elements, and, after dwelling a while upon the earth, becoming suddenly annihilated or gradually merged into new combinations, a constant destruction and reconstruction, a tendency to separation and differentiation, and a tendency to combine again into a common uniformity."

The work concludes with a brief summary of the principal

results of the anthropological research on the varieties of the human species which have been attained up to the present, as set forth in his address as President of our Institute, and published in our Journal for May, 1885, by Sir William Flower.

J. G. G.

"**Alone with the Hairy Ainu,**" or 3,800 miles on a pack saddle in Yezo and a cruise to the Kurile Islands. By A. H. Savage Landor. (Murray.) 1893. 8vo. pp. 325.

Mr. Landor travelled during the whole of his journey of 4,200 miles alone, without friends, servants, or guides. The volume is profusely illustrated and contains much valuable information. An interesting series of flint arrow heads and knives are figured, the pit dwellers' habitations are described, and the customs of the inhabitants are very fully discussed.

"**A year amongst the Persians.**" Impressions as to the life, character, and thought of the people of Persia, received during twelve months' residence in that country in the years 1887–8. By E. G. Browne, M.A., M.B. (A. and C. Black.) 1893. 8vo. pp. 594. The author gives a valuable account of his journey in Persia, and the volume contains a large number of notes on various dialects met with. There is an important chapter on Mysticism, Metaphysic, and Magic.

"**Les Émules de Darwin.**" By A. de Quatrefages. (Paris, Germer Baillière.) 1894. 8vo. 2 vols. pp. 441. These volumes discuss the views of A. R. Russell, Naudin, Romanes, Carl Vogt, Filippi, Haeckel, Huxley, Owen, Mivart, Gubler and Koelliker, d'Omalius, d'Halloy, Erasmus Darwin and Quatrefages (by E. T. Hamy).

"**Typee.**" A narrative of a four months' residence among the natives of a valley of the Marquesas Islands, or a peep at Polynesian life. By Herman Melville. (John Murray.) 1893. 8vo. pp. 301. This edition of a work originally published in 1846, gives an excellent account of the islands described. It is well illustrated and has two maps.

"**Social life among the Assyrians and Babylonians.**" By A. H. Sayce. (R.T.S.) 1893. 8vo. pp. 126. The volume, one of the "By-paths of Bible Knowledge" series, gives a clear account of the people, their mode of life, education, marriage, and death; the market, the money lender, and the tenant; slavery and the agricultural labourer, trades and professions, and the religion of the people.

"**Forty-two years amongst the Indians and Eskimo.**" By Beatrice Batty. (R.T.S.) 8vo. 1893. pp. 223. The book contains details of the life of the Right Rev. J. Horden, first bishop of Moosonee, and describes, in a popular manner, life among the Indians and Eskimo of his diocese.

"**Scottish fairy and folk tales,**" selected and edited with an introduction by Sir George Douglas, Bart. (Walter Scott.) 1883. 8vo. pp. 301. The tales are divided into nursery stories, stories of animals, giants and monsters, legends and traditions, fairy tales, the brownie, the boggle, the kelpy, mermen, demons, witchcraft, apparitions, wraiths, the second sight, comic tales, literary tales.

"What, in conclusion, is there in these rude old wives' tales to justify their withdrawal from the limbo of forgotten things? They have a place, though it be a humble one, in the history of the workings of the human mind. They are the manifestation, in its simplest form, of the literary or poetic impulse, and nothing that has been thus generated, and that has stood the test of time, as these tales have done, can ever, I believe, be unworthy of our study."

"**The New Zealand Official Year book, 1893.**" (Government Press, Wellington.) 8vo. pp. 456. This contains a large amount of information with regard to the colony, with statistics as to the Maori population.

"**Customary Law.**" Abstract of the code of, for the Amritsar district. Vol. xi. By J. A. Grant. (Lahore, 1893.) pp. 16.

"**The Tshi-Speaking peoples** of the Gold coast of West Africa, their religion, manners, customs, laws, language, &c." By A. B. Ellis. (Chapman and Hall.) 1887. 8vo. pp. 343. The titles of the chapters are:—Religious Beliefs; General Deities; Srahmantin and Sasabonsum; Local Deities; Deities worshipped by particular sections of the community; the Tutelary Deities of Individuals; Deductions; the Priesthood; Psycholatry and Human Sacrifices; on Fetishism; Oaths, ordeals, omens, &c.; Family divisions and animal worship; Division of, and mode of reckoning time; Religious Ceremonies and Festivals; Ceremonies at birth, marriage, and death; State Ceremonies; System of Government; laws, language, music, traditions and folk-lore.

"**An Australian language** as spoken by the Awabakal, the people of Awaba or Lake Macquarie; being an account of their language, traditions, and customs." By L. E. Threlkeld. Edited by John Fraser. (Sydney: Government printer.) 1892. 8vo. pp. 148. "This volume is issued by the Government of New South Wales as a record of the language of native tribes that are rapidly disappearing from the coasts of Eastern Australia . . . In all New South Wales there are only 5,000 full-blood blacks; only 400 or 500 in Victoria: and in Tasmania the native race became extinct in 1876." The grammar and vocabulary of the Awabakal, Minyung, Narrinyeri, Wiradhari, and Kamalari dialects are given. The volume contains an excellent map of the approximate limits of the various tribes.

"**Icelandic pictures** drawn with pen and pencil." By F. W. W. Howell. (R.T.S.) 1893. 4to. pp. 176. A reliable description of a ride through the island, with excellent illustrations.

"**La route du Tchad.**" From Loango to Chari. By Jean Dybouski. (Paris: Firmin Didot.) 1893. 4to. pp. 381. Map. The volume is well illustrated, with a large number of drawings of natives, weapons, &c.

"**The South Sea Islanders** and the Queensland labour trade. A record of voyages and experiences in the Western Pacific from 1875 to 1891." By W. T. Wawn (Master Mariner). (Swan Sonnenschein.) 1893. 8vo. pp. 440. Illustrated. "Captain Wawn was engaged in recruiting such labourers (Kanakas) from 1875, when they were first introduced, down to 1891, when the Queensland Government legislated against the importation of Kanakas into the colony, and their employment there."

"**Transactions of the New Zealand Institute, 1892.**" Vol. xxv. N.S. Maori nomenclature, by T. H. Smith. Unwritten literature, by R. C. Harding. Notes on some bone combs for dressing the head of a Maori chief, by A. Hamilton. Notes on some old flax mats found in Otago, by A. Hamilton. Discovery of Maori implements at Takaka, Nelson, by R. T. Kingsley.

"**Journal of the Anthropological Society of Bombay.**" Vol. iii. No. 1. Burial customs among the Bhuinhâr Brahmans in the Sâran district, Behar by S. C. Mitra. On some ceremonies for producing rain, by S. C. Mitra. The book for taking omens from snakes, by J. J. Modi. Indian folk-beliefs about the tiger, by S. C. Mitra. Caste measurement tables. An interesting Vedic ceremony. No. 2. Progress of Anthropology in India, by H. H. Risley. Notes on two Behari pastimes, by Sarat Chandra Mitra. Name-giving ceremony on a new-born child, by T. M. Nathubhai. Some curious customs among the Kochs, by K. Basu. A wild boy and girl, by S. C. Mitra. Caste measurement tables.

"**The American Antiquarian.**" Vol. xv. No. 5. Commemorative columns and ancestor worship, by S. D. Peet. (Illustrated.) Totem posts at the World's Fair, by J. Deans. No. 6. Personal divinities and culture heroes of the uncivilized races, by S. D. Peet. (Illustrated.) South American Archæology at the World's Fair, by G. A. Dorsey. On the words "Anahuac" and "Nahuatl," by D. G. Brinton.

"**The Scottish Geographical Magazine.**" Vol. ix. No. 12. The races of Trans-Caucasia, by V. Dingelstedt.

"**Revue L'Anthropologie.**" Vol. iv. No. 4. (1893.) The Agni, a W. African race (Pai-pi-bri). By Maurice Delafosse.

"**Fifth Annual Report of the Canadian Institute.**" 1892-3. (Toronto Ministry of Education.) Catalogue (illustrated) of specimens exhibited at the Columbian Exposition, Chicago.

THE JOURNAL

OF THE

ANTHROPOLOGICAL INSTITUTE

OF

GREAT BRITAIN AND IRELAND.

DECEMBER 12TH, 1893.

F. W. RUDLER, Esq., F.G.S., *in the Chair.*
Afterwards Professor A. MACALISTER, F.R.S., *President.*

The Minutes of the last Meeting were read and signed.

The election of the following new Members was announced:—

PERCY CALDECOTT, Esq., of the Constitutional Club.

ARTHUR EBBELS, Esq., of 87, Bromfelde Road, Clapham.

The presents that had been received were announced and thanks voted to the respective donors.

Mr. W. L. DUCKWORTH, B.A., read a paper on the "Australian Crania in the collection of the Cambridge University Museum."

The following papers were also read:—

"On an unusual form of Rush Basket from the Northern Territory of South Australia," by R. ETHERIDGE, Junr.

"On a modification of the Aboriginal Weapon, termed the Leonile, Langeel, Bendi or Buccan," and

"On an Australian Aboriginal Musical Instrument," by the same.

"The Aborigines of North Western Australia," by P. W. BASSETT-SMITH, R.N.

"Rites and Customs of Australian Aborigines," by H. B. PURCELL.

"Japanese Onomatopes, and the Origin of Language," by W. G. Aston, C.M.G.

REMARKS *on the* FLINT IMPLEMENTS *from the* CHALK PLATEAU *of* KENT. By A. M. BELL, M.A.

[WITH PLATES XIV, XV, XVI.]

[Read November 14th.]

THE paper read by Professor Prestwich to the Institute[1] on June 23rd, 1891, brought forward and supported two distinct propositions: first, that the worked flints found on the Chalk Plateau are of an early date, which can on geological evidence be shown to be earlier than the date of implements found on the Greensand escarpment or in the raised terraces of the neighbouring river valleys; and second, that a large class of chipped flints, found on the plateau, which do not possess either in their forms or in their workmanship the full characteristics of flints hitherto recognised as artificially worked and shaped, still do possess true and trustworthy indication of human handiwork, and point us backwards to an early age in the development of mankind. In both of these views, which were supported by detailed argument, acquaintance with the locality, and with the implements or supposed implements in question, leads me to believe that Professor Prestwich was right, and that, as the subject receives close and further examination, so will each of his conclusions be established and confirmed.

This cannot be said to have been the view taken by his audience. The subject was one which required a reconsideration of previous opinions, which cannot be given in a moment; hence in the discussion which followed, those who approved rightly assumed a guarded and tentative attitude, while disapproval put on no such limitation.

Professor Boyd Dawkins denied both the conclusions of the more venerable Professor; he would neither accept the age of the plateau finds as anterior to river-valley finds; nor would he allow the new class of implements. The authority of Professor Boyd Dawkins' opinion is justly great, so that it is natural to attempt to understand the reasons which he found convincing, and to follow them out a little, to find whether they are in harmony with the facts which they undertake to explain. He is reported to have said that he saw no reason why flints found at the top of a hill should be older than flints found at the bottom of a hill. River-valley man was a wanderer, and was careless of possessions which were cumbrous to carry and easy to replace; hence he dropped flints here and there as he passed to and fro.

This theory is true; so far as I am aware, it has never been denied that this supposition rightly accounts for a few, an exceptional few, of the flints of the plateau. Some flints have eben found there of excellent workmanship and perfectly regular types. They are not numerous, and some years of searching

[1] "Quart. Journ. Geol. Soc." May, 1889; "Journ. Anthrop. Inst.," Feb. 1892.

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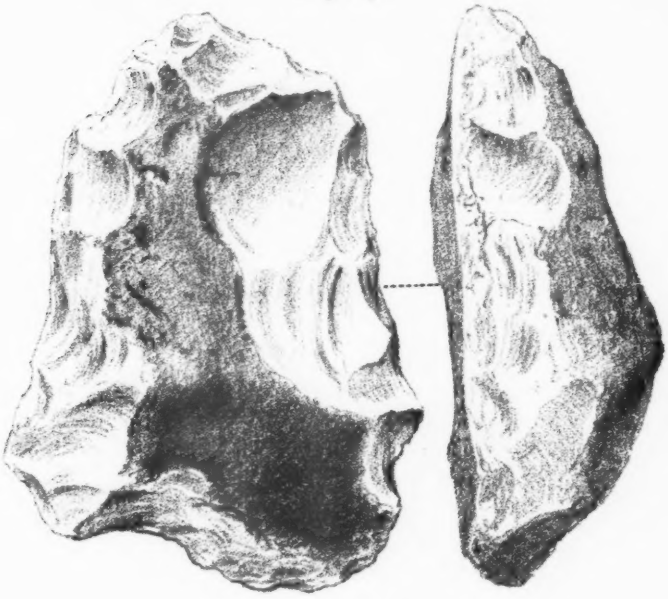

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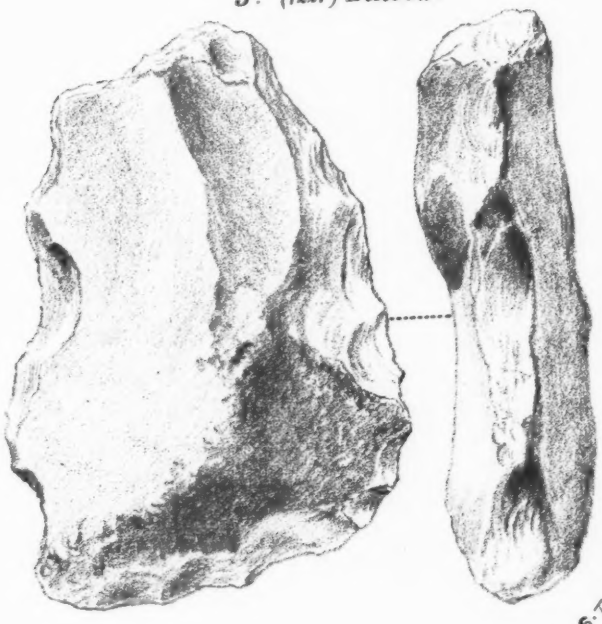

W. S. TOMKIN DEL.

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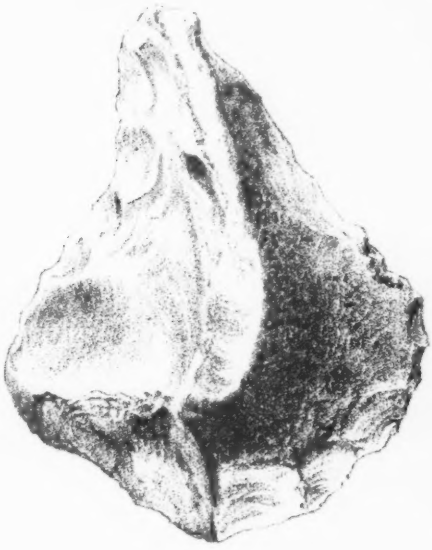

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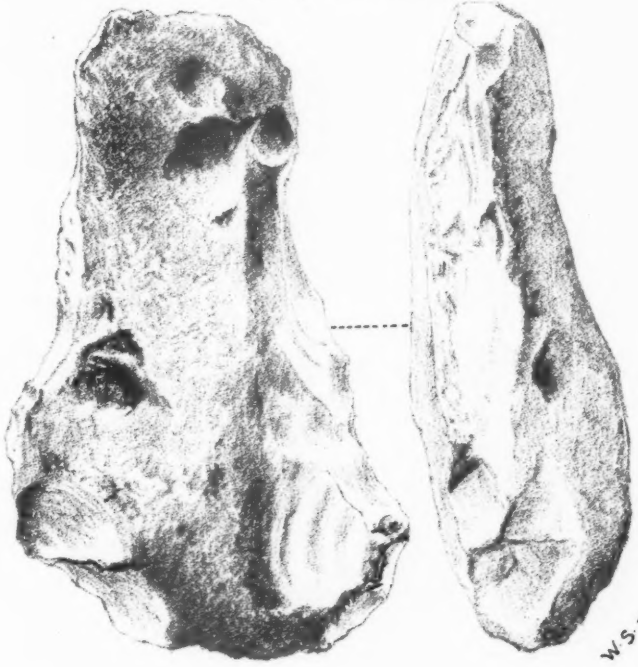

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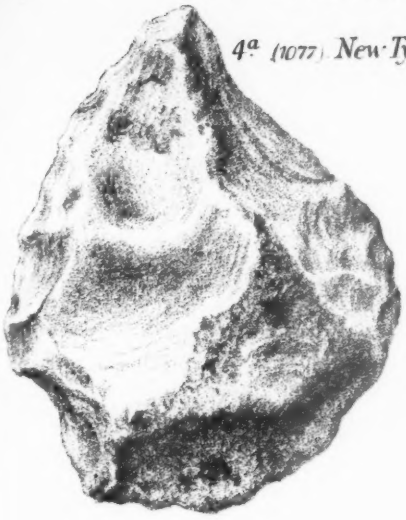

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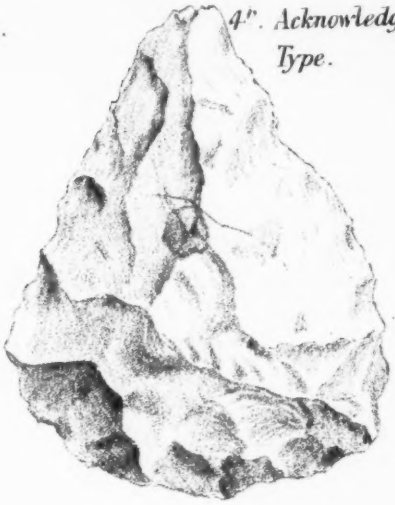

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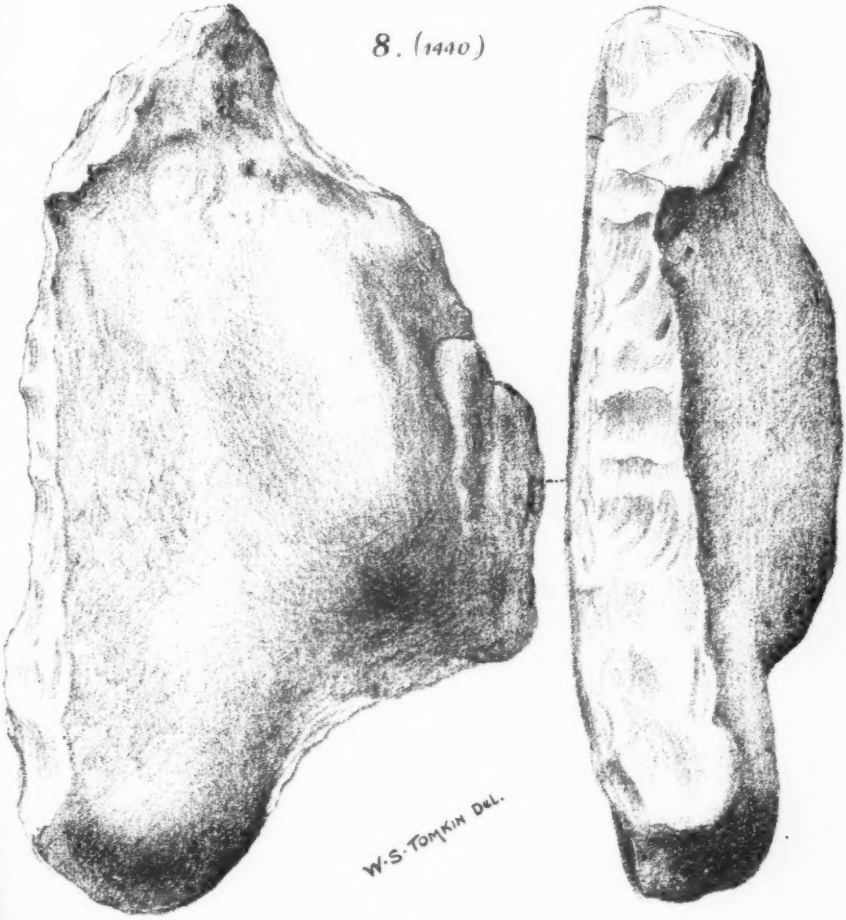

W.S. Tomkin Del.

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passed before one was found. When first one of them was put before me, the theory of Mr. Harrison, its discoverer, was the same as that by which Professor Boyd Dawkins proposes to account for all the flints of the plateau; the flint had been dropped by river-valley man in his nomad life. Still, this admission does not shake or impair the belief that the majority of implements found on the plateau are of greater age. Surface finds, as will subsequently be shown by an example, must necessarily contain objects of various ages; the river-valley stage was of long duration, and the North Downs were undoubtedly exposed, during the period, so that some relics of the time are naturally to be looked for on the heights. But we do not associate them with the majority of the finds. The few flints of ordinary palæolithic type found on the plateau are quite unworn and unrolled, their edges are sharp, as if they had fallen to the ground when freshly used, and stopped where they fell. They throw themselves into a class by themselves, alike by their number, their condition, and their type. The majority are in a different case; they are worn and rolled; in other words, they are no longer in the place where they fell, but have travelled from some distance and been brought down from elsewhere to the places in which they were found lying. They are moreover found, some of them at all events, in distinct patches of ochreous gravel, from which they cannot be distinguished. The rolled condition and the association with worn and ochreous gravel are the points which riveted the attention of observers on the spot. Yet if I understand the Professor aright, his contention, as we follow it out a little in the presence of the facts to be explained, is this: "You have here a spread of gravel, excessively worn and rolled, and peculiarly stained, quite different from the blue and white sharp-edged flint in the neighbouring fields. Worked flints lie in the gravel, and are worn and stained exactly as the gravel is worn and stained. Yet you are wrong to associate the worked flints with the gravel; you will do more wisely by associating them with a few worked flints, which you have also found on the plateau, but which in shape and condition show quite different characteristics." Now, I decline to follow this verdict, because the flints themselves pronounce against it. Yet let us grant the supposition for a moment, and see to what it leads us. Wandering river-valley men dropped in these gravel-beds a worn tool; as it was worn, it belonged presumably to his predecessors. Granted, it was possible for him to find a worn implement by burrowing in a raised terrace of gravel, but where could he have found one similarly stained? I have seen hundreds of Thames river-valley implements, and have had ten years' acquaintance with

the surface soil, and have only found one such implement, and seen two more, obtained by Mr. Worthington Smith, in gravel beds near Canterbury[1]; where they could have been procured in numbers I do not know. Yet unless this is plain, Professor Boyd Dawkins' theory is not intelligible; even if it were plain, is it not a theory which chooses the improbable instead of the obvious? Why should we not believe that stones, formed of the same material, found side by side, alike worn and alike weather-stained, owe these peculiar effects to the same causes?

In a more recent paper,[2] Professor Boyd Dawkins again alludes to this subject. This time his argument is of a different nature, not perhaps quite consistent with the first, in which the implements were considered as of regular palæolithic type and age. They are now to be considered as imperfect implements, the wasters of a toolshop. "The splinters and other rude fragments of the block must preponderate in the places of manufacture, while the finished implements are carried off for use elsewhere, and are likely to be more numerous where they have been used and lost."

Very good and true when rightly applied, as it is rightly applied to axes of palæolithic form but neolithic age and weathering, found on the surface of the South Downs. But let us examine the argument a little, and find whether in the present case it fits with the facts, and suggests their probable solution. We are to consider the plateau as a workshop. I have never had the good fortune to light upon a palæolithic floor or workshop, in or nearly in the state in which it was left by its quondam occupants, but I have seen many neolithic workshops, and will describe their salient features. Botley Hill, the height above Titsey Place, was a workshop; there flints were mined from the Chalk, and on the fields around hundreds of rude lumps, awkward spalls and splinters lie about, together with a smaller proportion of ordinary flakes and a few scrapers. Evidently the rude blocks, as they were taken out of the earth, were roughly shaped at the pit-mouth, before they were conveyed further. About a mile distant to the south, on Broomlands Farm and the Rocks Farm, are two sunny ridges, where the soil abounds in small, fine flakes, often very tiny and very thin. These were also workshops, where celts were fashioned, and fine workmanship was done. In the great manufactory near Berling Gap on the South Downs, I saw in one large field many thousands of flakes; at the sight of the extraordinary numbers—more than all the waste heaps in Brandon village—the words involuntarily rose to my lips: "This was a workshop, these

[1] See "Man, the Primeval Savage," by Worthington G. Smith: London, E. Stanford, 1894; p. 216, for an illustration and account of these rare implements.
[2] "Journ. Anthrop. Inst.," Feb., 1894.

are the shavings which still line the floor." Such a sight I have never seen on the North Downs, nor anything in the very least resembling it. After searching for hours together on what was reckoned fertile ground, I have thought it fair fortune to carry off a single worked flake, and have often found nothing at all. This does not resemble a place of manufacture, and the point at issue, that of numbers, is one which must be essential to a place of manufacture: a workshop where the materials left behind are few and far between is on the face of it an improbable theory. Let us follow this argument also a step further. Professor Boyd Dawkins, as previously said, is asked to account for certain rolled and worn stones; they are the *crux*; on their account a special and geologically definite age has been claimed for the plateau finds. His answer is: "They are the remains of a workshop, the useless out-throw left lying on the ground." How can the relics of a workshop be rolled, since the wear of rolling means that they have been moved? The flakes found by Mr. Spurrell in a palæolithic workshop at Crayford are as sharp to-day as they originally were. The sharp edges of both flakes and implements found on the palæolithic floors at Caddington and at Stoke Newington are constantly mentioned by Mr. Worthington Smith in his attractive work already referred to. Why are those in the plateau so different? Professor Boyd Dawkins does not say, but I submit that, before he asks us to believe anything so improbable in itself and so contrary to experience obtained in other places, he is bound to explain what he supposes the conditions to have been under which flints with their angles all rolled away are to be regarded as still lying on the spot where they were chipped from the parent block. Until he does this and persuades us, why should we not believe that the line of argument, chosen and maintained in detail by Prof. Prestwich, is very much the more probable—namely, that the stones are not on a workshop floor at all, but in an old gravel-drift, which reached its present position, and obtained its present condition by rolling down, in accordance with the law of gravitation, from some higher level?

In the same article is another statement, which, in the broad way in which it is stated, ought not to pass unchallenged. On page 250 are the words: "The implements of palæolithic form which lie scattered over the surface of Southern England are not necessarily of palæolithic age." Certainly they are not, but with a very important limitation, which the writer does not add—namely, that the condition, material, and weathering of the flints in question associate them with the neolithic remains which lie scattered equally or more abundantly over the surface. I trust

that I do no injustice to Professor Dawkins' line of argument in trying to follow it out, and place it in distinct form and outline before my own mind. I understand it thus: "A true find is *in situ* in the solid shingle of a gravel-pit, or in the soft unstirred layer of brick-earth. When a flint is found on the surface, it cannot be proved to be older than the most recent surface-age." This position is very natural, quite right to start with, but let us examine if it is tenable at the last. Suppose a collection of flint implements from the same area, in which the distinction of neolithic and palæolithic forms distinctly appears. This of itself creates two classes. Next suppose an implement found, which is palæolithic in shape, but otherwise does not resemble the supposed palæolithic flints and does resemble the undoubtedly neolithic flints, then it is rightly classed as a neolithic accident. If the collector has himself attempted to shape flint with a quartzite pebble as his hammer, he will well understand the possibility of accidental shapes arising. But on the other hand, if a whole series is found, in which various acknowledged palæolithic types are all reproduced, and all or almost all of the implements have not been shaped out of flints quarried from the Chalk, such as neolithic men chiefly used, but are made of the weathered surface flint; if further, all the implements are weathered and cracked by time and exposure in a perfectly different manner to the neolithic flints found on the surface, why should we not believe them to be of palæolithic age? To what other age can we refer them? During the years 1883–1889 a collection of this kind was obtained by the writer from the surface soil near Limpsfield in Surrey. The collection was seen by various competent persons, none of whom doubted that it came from palæolithic times. All the examples, hundreds in number, came from the surface, with one exception which might have been explained away, as an accidental drop-down through a sun-crack in the soil. Yet various reasons led me to associate the finds as a whole with the time when the Limpsfield gravel-bed was deposited, and also with some neighbouring deposits of brick-earth.[1] In 1889 a paper was written by me, though not published, containing the reasonings which led to this conclusion. This position deserves notice; Professor Boyd Dawkins, unless I misunderstand him, would say, "surface finds, not necessarily palæolithic." Continued observation of seven years led me to say, "surface finds, but synchronous with the gravel and brick-earth."

In the years 1890 and subsequently numerous *in situ* finds in the gravel and one in the brick-earth proved that my inferences were true; but they were just as true before the finds were made

[1] W. Topley, "Geol. of the Weald," p. 193, 4. J. Prestwich, "Quarterly Journal of the Geol. Society for May, 1891," pp. 137 and foll:

as they were after them ; yet unless I mistake his meaning the Professor would have attached no weight to them at all. This is pushing a sceptical attitude too far ; any one who reasons on subjects so complex and remote from experience will do well to recognise clearly the nature of the conclusions to which he is limited by the facts. Absolute certainty comes from consciousness alone, and is impossible ; testimony supplies a second or borrowed consciousness, and is equally impossible. For this reason a sceptical attitude is the right attitude to begin with. But as facts are amassed, they begin to throw themselves into ordered classes, and arguments of greater or less probability begin to arise from them. Probability is all that can be obtained, but when probabilities are great and all point in one direction, then the sceptical attitude may be dropped, and a positive and constructive parable should be taken up and expounded. Those who are interested in the subject know the nature of the reasoning, and are content to consider that very great probabilities are identical with certainty.

Viewing this part of the inquiry in another light, it is worth while to show that surface finds are necessarily various, and yet may with practical certainty be referred to various ages and various workshops. On the surface of the same field in Surrey I picked up at different times the following miscellaneous collection; (1) the arm of a child's doll, in porcelain ; (2) a Brahma-bull, in Indian soapstone ; (3) the lid of a Wedgewood teapot, in black basaltes ; (4) fragments of oriental and mediæval pottery ; (5) a coin of Septimius Severus; (6) a neolithic arrow head ; (7) a palæolithic axe ; (8) a rolled pebble, of Tertiary quartzite; (9) a fossil, coniferous wood from the Greensand ; (10) a rolled pebble of Lydian stone, of palæozoic age. Though these objects occur together, we are by no means bound to consider that the arguments by which we refer them severally to various dates in a long sequence are at all fallacious. We do not lump dissimilars together, but make distinctions, and refer the separate product to a separate workshop and a separate age.

Now let us go back to number eight in the above list. How does it happen that a rolled pebble of Tertiary quartzite comes to lie on the surface of the Lower Greensand ? Is it not because it represents an older formation which once spread generally over the area, but has now been entirely wasted away, with the exception of a few fragments of its hardest portions, which by their material show what they are, and by their polish, that is their continued rolling, show what they have suffered ? This will hardly be denied, and proves that it is equally possible that on the exposed ridge of the North Downs or elsewhere, earth

may have been washed away so as to leave on the surface a series of hard flints once encased in soluble clay. This I believe to have happened both on the Greensand encampment and on the Chalk Plateau, and to be a very good reason for assigning surface finds to palæolithic age.

Professor Boyd Dawkins goes on: "The materials out of which the implements have been fashioned, the colouring and the abrasion of their angles and edges, appear to me to be merely local accidents, and unimportant for the purposes of classification." This again is hewing with an axe, when a dissecting knife is the more appropriate tool. Local accidents they certainly are, but why are they unimportant? If we find that neolithic flints found on the surface are framed from selected flints, quarried from the chalk, and that palæolithic flints have been shaped out of stones picked up on the surface and not quarried; if we can prove this to be so by portions of the bark or original unworked surface on portions of their sides, which in the palæolithic flint is rusty and brown, like the long-exposed surface flint, and never so in the neolithic, why should we consider the material unimportant? "But weather and wear are treacherous signs." Certainly they are difficult, and a series of chemical experiments on the subject is very desirable; on my table as I write are two flints taken from the Roman Villa in Titsey Park. Beyond doubt they were chipped at the same time by the Roman mason; yet one is weathered, and the other is unaltered. So from an isolated example of weather I am in no haste to draw a conclusion; but it is different with a class. Find twenty worked flints in a gravel-bed, and as surely we shall find that the weathering of the flints as a class finds a counterpart in the weathering of the gravel as a class. So when we find on the plateau spreads of implementiferous gravel perfectly peculiar in their staining and in their rolled and weathered condition, it is in a certain sense a local accident, but is not unimportant. The result is general and not isolated, and therefore due to a cause which worked on a general and extensive scale. Even an isolated local accident, such as the occurrence of a single erratic, may be important and lead to grave inferences. Local accidents, which group themselves together, are very, very rarely unimportant. The striation of a boulder which we can hold in the hand is an apparent trifle, yet because such boulders and such striations formed a class, the accident has led to great conclusions. The clay at Hordwell, with its contained fossils, is a local accident, which Mr. Brander, the keeper of the British Museum a hundred and thirty years ago, "was apt to think would remain for ever a mystery." Instances of this kind, in which local accidents have

proved to be both more important, and more susceptible of explanation than they were originally supposed to be, will readily occur to a Professor of Geology. So also with surface finds; if they possess definite characteristics of form, of wear, of weather, of material, of working, of position when found, each of which places them in a class by themselves, much more all when taken together, then these are certainly local accidents, but they have their importance. There is a key called Promise, which will open the doors of Doubting Castle. Beyond doubt it is at once more delightful and more satisfactory to find *in situ*, and the more numerous and perfect the associated remains of extinct animals, so much the better. But let us recognise that we cannot always be so fortunate. Nature does not create deposits simply to further palæontological research; yet even when this crowning evidence is denied we are not left desolate. Time does not go by without leaving its record: change does not take place without a cause; we may yet follow these changes, and interpret these records, instead of tossing them aside as unimportant.

Therefore I am unable to find these arguments convincing: the first, because it explains little; the second, because it is inapplicable; and the third, because it goes beyond the due limit of a negative attitude; and further and chiefly, because the arguments, when viewed as a whole, or followed out to their conclusions, recede more and more from the facts at issue, and leave the conclusions of Professor Prestwich untouched.

Professor Boyd Dawkins was equally opposed to what I have called the second proposition of Professor Prestwich, the acceptance of a new class of flints as having been used by man, and in this he received a qualified, not an absolute support from the highest authority. Sir John Evans refused to accept by far the greater number, not all, as I understand, but by far the greater number of the flints produced as coming from the hand of man, and asked his hearers to think once, twice, and thrice before they accepted them as of human workmanship.

These words are the text of the following remarks[1]: such a caution is natural and intelligible; for several years I held myself the same negative attitude, and thought much oftener than three times before altering my opinion, and now see no reason to repent, nor any way to escape from the reasoning which convinced me. So I would ask all who are interested to think once, twice, and thrice. The first sight may create aversion and mistrust because the collection as a whole differs from what

[1] It should perhaps be said that this article was substantially written towards the close of the year 1891, though it has been slightly remodelled before publication.

we have long regarded as alone deserving to be thought worked or used flints. But if this initial diffidence be looked in the face, and the types examined individually on their own merits, and not in the light of preconceived ideas, then I believe the flints will be found to have a good deal to say for themselves, and will confirm Professor Prestwich's view. Hitherto it can hardly be said that they have had a patient hearing, and it is not fair that the conclusions which have been reached by competent investigators by patient research extended over a series of years, should be rejected in as many minutes after one hasty glance. Such, I am convinced, will not be the attitude of the limited public who wish simply to find the truth: they will think once, twice, and thrice.

In the year 1885 one of these implements was first put into my hands by Mr. Harrison, at Ightham, and my opinion was asked. It was a tabular flint, with blunt, rectangular edges, chipped all round. I remarked at once on the absence of bulb, and denied therefore that the flint was shaped by man. The chipping on the edges might, I said, have come from Nature. Suppose a flint to be jammed in a stream; the edge that is uppermost becomes chipped by the pebbles which float down with the current; let it be dislodged, and fixed again elsewhere with another edge upwards, that edge will become chipped, and so all edges may be chipped. Again a flint in a gravel-bed does not always lie quite still: water filters through and creates hollows: the incidence of pressure alters, and with each slight subsidence the edge of a flint becomes chipped, sometimes with surprising regularity. So I refused to accept it, and asked Mr. Harrison if he had shown such a flint to Sir John Evans. He replied that he had, and had received an answer to the effect that any doubtful flint without a bulb might be thrown away; it would lead to no fruitful conclusion.

This was much the opinion which I had expressed myself, and I had good reason to think it sound doctrine. I was very sensible that the peculiarity of flint to break under an artificial blow into a strongly-marked conchoidal fracture, first pointed out, I believe, by the late Professor Falconer, had thrown an unexpected light upon studies which, before its importance was appreciated, were jumbled and uncertain. By the aid of the evidence of "bulb and flake" I was then developing the palæolithic field around Limpsfield, which was producing an instructive harvest. Week by week was bringing in some type figured by Sir John Evans, until almost all appeared. From his works I had first derived clear ideas of the importance of flint as a factor in the material progress of mankind; I had learned to look on human life in a newer and truer aspect: by

visiting almost all the sections named by him I had seen for myself the geologic evidence of the long lapse of time which separates river-valley men from ourselves; with his impressive words in my mind I had looked on Barton Cliff, the Solent, and the Isle of Wight, a scene, which more than others in our island, enables us to set ourselves free from what is to most of us a real difficulty, the inability to conceive that man can really have lived in the world for such a very long time, and did certainly exist at a time when the features of land and sea presented scenes very different from those which now meet our eyes. Above all, the kindness of Sir John Evans had taught me to distinguish a worked flint from a natural fracture—not a very easy problem to a museum-taught beginner stranded on a bare field with a million broken flints around—and I had no disposition, then or now, to put myself on a level with my teacher. Therefore I held by his dictum; the bulb was good doctrine, assuring practical certainty and a definite guide, which a plain man could follow and all could understand. For several years I looked upon this opinion as decisive: the bulb was essential.

I have now changed that opinion, slowly and after mature deliberation, and believe that I was as reasonable in rejecting it as I had previously been in adopting it. The flints themselves, and they alone, persuaded and convinced me—partly those in Mr. Harrison's collection, partly those found by myself in numerous excursions to the Chalk Plateau.

The first of the unbulbed flints to shake my previous judgment was a tabular flint chipped all round the edges. It might have been natural; but the regularity, the sameness of strength in the blows, gave to the stone a character, an indefinite something which seemed the expression of a purpose, and not to be due to the irregular, random work of nature. At the same time I would give way no further than to allow that such an example might very probably be of human handiwork, not of Nature's. The example given (Plate XIV, Fig. 1, 739 in Mr. Harrison's collection) is one of this class. It is very hard to believe that the flaking here is accidental.

I was more strongly decided by one, or rather by several of the curved and notched specimens, similar to that figured by Professor Prestwich, No. 4, Plate XX, vol. xxi of the Institute's Journal. I could not think of a natural method by which the centre of a small but deep curve should be neatly and regularly chipped, while the prominent and exposed ends of the curve are untouched; much less how this could occur in a number of instances. A large series of this type has been collected by Mr. Harrison and Mr. Crawshay. They seem to me decisive; think once, twice, thrice, as I may, I see no natural means of

producing such chipping, nor do I find flints so notched by Nature in any of the gravels which I have examined. Artificially it can easily be done; the tool produced is one which would naturally be in request to scrape down a stick or a bone; one which, in some form or other, is found throughout all the stone periods.

As soon as I was satisfied of the particular fact that, to the best of my judgment, the hand of man had been at work in chipping some, if not all, of the unbulbed flints, which Mr. Harrison was now amassing in considerable numbers, I endeavoured to put the subject and its issues before my mind in its more general aspects. It appeared to me in the following lights:—

1. The palæolithic implements had hitherto been the earliest acknowledged handiwork of man; but the palæolithic implement is, on the face of it, a very advanced and artistic production. Neither in shape, nor in workmanship does it show any indication of a prentice-hand, and far from being the first-born of human tools, must represent the last stage in a long, long series of artistic development. (On this truth, for so it may be called, Sir John Evans speaks in p. 574 of his great work; and at the discussion on Professor Prestwich's paper, the argument was dwelt on by Gen. Pitt Rivers.)

2. If man, as I believe, has risen to his present position from being a wild animal in the wild forest, there must have been some stage in his progress, which we may call the pre-palæolithic stage– that is to say, he used a stone tool, but he had not the skill which palæolithic man had; he could not break up the hard, intractable, waterless flint of the surface soil into thin, sharp, useful flakes; nor had he the art to shape it into curve and oval, butt, blade, and point, putting into execution a conceived purpose, which contained a conception of symmetry as well as of utility; he simply picked up a stone and used it as it was. Such a tool would become chipped at the edges which were used.

I was not aware at that time that such stones were habitually used by any modern savages. Some years afterwards, Mr. Henry Balfour, the Curator of the Pitt Rivers Museum at Oxford, pointed out to me a stone taken from the hands of a Bushman in S. Africa. This stone had been one of the native's chief implements, yet it shows less sign of use by man than any of those now under discussion.

Nor was there at that time in England a collection of Tasmanian implements. Among those which have recently been obtained by Dr. E. B. Tylor for the Oxford collections, there are several scrapers, artificially chipped at the edge, but broken by nature from the parent rock. They were picked up and so used.

Such tools may habitually be used at the present day. Last August I was staying at Eyemouth in Berwickshire, and there had the pleasure of meeting Mr. John Oliver, a young fisherman, quite as civilised a person as myself. Mr. Oliver had the reputation of making excellent bone needles for mending nets, and he made them by grinding the bone down on an ordinary shore-pebble. This, he said, produced an implement less liable to break than manufactured articles sold in the shops. I could not help reflecting that his method was faithful to very ancient custom indeed.

3. Granting that such an age existed, is it possible to be certain about any relic which it has left behind, or must we hold fast by the dictum, "No bulb, no certainty"?

4. No conclusions could be based on isolated examples, as Nature chips flints as well as breaks them in very strange fashions. Any sound inference could only rest on numerous examples, and some definite types of simple and intelligible tools.

5. Such an age might be expected to be the precursor of the age of palæolithic implements, which were shaped into definite forms and not merely chipped round natural edges; but if we were really on the track of such a time, we should be likely to find some similarity in the forms, some trace of transition from the shapes of the earlier into those of the later time.

6. The acceptance of these flints, their authenticity, rested on the strongest part of the evidence, and did not fall with the weakest part of the chain. I saw in Mr. Harrison's collection a number of flints which, I considered, were and always would be in themselves inconclusive; man or Nature might have formed them, and the prudence of associating them with the others seemed questionable. On the other hand, of some I was quite satisfied; of others, the probability in their favour was so very strong that I felt they should be accepted. Thus the principle was admitted; these types could not reasonably be rejected; the weakness of the others did not affect them, while the weaker class, which still hung in an even balance, received a very strong accession of weight and strength from the necessary admission of the others.

I am not sure that I have placed this line of argument clearly before a reader; but I am quite sure that those who enter closely into the subject will find at some point that they are face to face with the same reflection; the strong cases prove, the weak do not disprove.

Naturally, other complex problems arose, connected with the age and source of the drifts, their relations to each other and to the neighbouring deposits. It was very clear to me, as a practical worker in the field, that the flints on the Chalk

Plateau had a different character and an appearance of greater age than those on the surface of the Lower Greensand around Limpsfield. This struck me very strongly the first time that I saw a bulbed flake from Ash. Similarly I judged that the Limpsfield gravel-pit, standing at 490 level, with one of the sources of the Medway issuing from it, belongs to an older state of things than the raised valley-gravels of the existing Medway. There was at that time a large gravel-bed at Oxted station, about 40 feet above the level of the present stream; it was entirely composed of drift from the pit at the higher level. But at the time of which I write Prof. Prestwich's paper on the relative ages of the river-valley gravels in the Darenth basin[1] was yet unwritten. Most willingly do I confess my obligation to that article for its clearness of view, breadth of treatment, and wealth of facts, obtainable only by long and persistent observations. His conclusions seemed to fit exactly what I had long had before me in the limited area which I was able to study closely. The conclusions were these: that the gravels belong to three distinctly marked epochs; (1) the river-valley epoch, when the rivers flowed in their present limits, but in higher channels; (2) the Greensand epoch, when watersheds were not the same. This was typified to me by the Limpsfield gravel-bed, which now crowns a hill, and gives a source to the Medway on one side and to the Darenth on the other; but originally, like all other gravel-beds, was deposited in a valley and not on a hill-top; (3) the Chalk Plateau epoch, when watersheds were more different still, and the general surface of the ground much less denuded, and very different from its present outlines. This stage, in the Professor's view, was early glacial or pre-glacial, and the great denudation was largely due to the action of glacial conditions.[2]

When this paper was published, the conclusions seemed to me in perfect harmony with the features of the district, but this somewhat anticipates. At the time of which I write I was only satisfied that the beds of ochreous pebbles on the plateau were true drift-beds, which had come from some distance, from above

[1] "Quarterly Journal Geol. Soc.," May, 1891, vol. xlvii.

[2] These conclusions have at least a general resemblance to those to which Mr. Skertchly was led by an examination of the Suffolk district in 1875. His conclusions, published in 1879, among the memoirs of the Geological Survey, were that three periods in the life of Palæolithic man could be traced: (1) the Late Palæolithic, in river valleys, which cut through the boulder-clay; (2) the Intermediate Palæolithic, which belong to an older valley system, running at right angles to the present rivers Lark, Little Ouse, and Stoke; (3) the Early Palæolithic, which are older than the chalky boulder-clay. All three periods Mr. Skertchly considered to be Interglacial, and separated from the Neolithic period by the Hessle boulder-clay, though he gives this conclusion as a "legitimate inference," as the direct evidence of superposition is absent.

what is now the Wealden area, bearing with them the majority of flints now under discussion. In one of the drift-beds at Ash I came upon a perfectly rounded pebble of Oldbury stone, which is a quartzite of the Lower Greensand, and easily recognised. Unless we assume improbable and exceptional suppositions, this pebble must have rolled downwards when the Chalk Plateau and Lower Greensand escarpment were in one continuous slope, and not separated by the present broad valley of the Gault; the Lower Greensand must have risen to a much higher level than it now does. This instance was typical but not isolated, for at several places between Ash and the Chalk escarpment pieces of the same conspicuous stone were found. Similarly the extraordinary wear of the flint pebbles in the large bed at West Yoke impressed me much, as it has every geologist to whom I have shown examples. It had travelled far, and contained many of the supposed implements in indubitable association.

But the first question to settle was, "Were the chipped flints genuine? were they chipped by man?" Here I stood face to face with the saying of Sir John Evans—very probably accepted by myself in a broader meaning than he intended to give it when the words were somewhat casually spoken—at all events a saying which I had previously maintained, and have never been disposed to slight. I felt that the saying could not be maintained. When the bulb has been removed from a neolithic flint, it is not necessarily rejected. Why? Because there is otherwise sufficient evidence of human handiwork. In such cases this usually lies in the flaking; but, I reflected then and believe now, evidence of a human hand may lie in the edges as well as in the flaking. On carefully examining Mr. Harrison's collection I found several examples in which bulbed flakes and unbulbed broken flints could be placed side by side, in which the chipped edge of the one was practically identical with the chipped edge of the other. Two such examples have been drawn by Mr. Tomkin, and are figured in the plate. Figures 2*a* (1599) and 2*b* (2693) feature each other very closely. If one had a purpose, had not the other the same? Now Fig. 2*b* has a bulb, and is undoubtedly of human workmanship. Nos. 3*a* (1221) and 3*b* (1234) are both rude scrapers; 3*b* is bulbed and undoubtedly artificial; can we reject 3*b*, which has rather more signs of use?

Now in the edge the evidence of use by man is to be sought and found; when this, the final result, is identical and peculiar, why should we refuse to believe that the producing cause was the same? Is it not the more probable conclusion, to which not one but several lines of reasoning conduct us? Since that time I have seen in Mr. Crawshay's collection some flints of the same nature, which were very convincing.

Evidence of Transition into acknowledged Types.

At the time of which I write evidence of a transition from the natural flint chipped to the flint artificially shaped or common river-valley type was not striking. On an excursion to Ash with Mr. Harrison we obtained more than one example, which in shape seemed to be true predecessors of the pointed end and heavy butt of the later type. This was a prediction fulfilled, and therefore gave us pleasure. Since that time a considerable series has been obtained. Of these one is figured in the plate: No. 4*a* (1077) is one of the implements which Professor Boyd Dawkins and others reject; 4*b* is an undoubted implement from the L.G.S. escarpment. I think that 4*a* is 4*b*'s very near relation.

In this part of the inquiry two other points deserve notice. The palæolithic workman flaked the weathered surface-flint with wonderful skill by taking off thin flakes right along the surface. In a number of these debated flints the same art is visible, though less in degree; a flake of considerable length is just nipped off the surface.

This line of argument is analogous to the evidence of an adept in handwriting, and from long study of the palæolithic tool of the surface I am disposed to give it great weight. Nature does not adopt this style of chipping, but when chips extend far over the surface they strike deeper. Several such blows together seem to me evidence of the human hand, which it is very difficult to disbelieve.

The next point was brought under my attention by Mr. Harrison. It is that in some of his examples the edges are so regularly chipped as to call to mind the familiar graceful palæolithic curve or sweep.

All these points tend to the belief in a sequence. It is undoubtedly possible to argue that the flints were themselves to begin with similar in shape, some were chipped by nature, others by art; but the present resemblance is entirely due to the original similarity of the untouched pebbles. Here the question of numbers becomes of weight. Nature may work one or two examples in a style which imitates the most inventive of her sons; but Nature will not give numerous examples of definite types, whereas this is precisely what man will do, and because these series of definite types have appeared we do believe them to be the work of man. Grant, as I do not, that to start with the probability on either side was even, with each succeeding example of similarity in definite types the scale falls down, down, down in favour of a purposeful, reasoning agent and against accidental Nature.

The curved flints or drawshaves also find their representatives

in the flakes with hollows in the side, which occur in all river-valley gravels, and were probably used for rounding wood or bone. The analogy is not at first apparent, because the curved flake is thin and much more suitable for the purpose than the thick, curved scraper. Yet in either case the essential is the same, a rounded curve with a used edge.

A number of ovoid forms from the plateau also do very much feature the ovoid implement of river-valley type. In this case, however, I thought and still think that the natural form of the pebble is too important a co-efficient to be ruled out of the result. The ovoid is the common form of the unworked stone, and if the edges are altered either by man or by Nature, this form will appear by necessity rather than by purpose. This may appear hypercritical; it is, however, based on local experience. In the implements of my local collection I found that the true oval was a very rare form, whereas the ovoid was very common.

Blunt Edges a Difficulty.

Sir John Evans very rightly pointed out what has always been a difficulty. The edges of the so-called scrapers are so blunt, or rather rectangular, that it is hard to see what purpose they could have served which could not easily have been better obtained by a sharper tool. I have always felt the force of this objection, and do not profess to have solved it. The only solution known to me, that the people who used these tools were at once very stupid and very muscular, is unsatisfactory, and I allow to the full the novel appearance of the rectangular scraper. At the same time the difficulty of seeing only Nature's hand in working so regular and examples so numerous is to me a greater difficulty. Nor can we expect that in subjects so distant from our experience everything is to be perfectly plain. Even neolithic types, such as the Scotch hexagonal balls, are perfect puzzles, and unexplained neolithic accidental forms are common. We can only guess at the use of certain palæolithic forms. Why was the ogival curve so elaborated? What special purpose could have been served by a short and thick subtriangular implement, with jagged edges? In truth we do not know, but we do not doubt the implements. So with blunt edges; they are a difficulty, but they are in respectable company. One of these blunt-edged examples is figured, No. 8 (1440). The chipping of the edge, the handle in the butt, are so purpose-like, that I certainly am unable to see here only Nature's hand. Further, these remarks do not apply to all the scrapers. Some of them, especially those formed from split pebbles, closely resemble the orthodox palæolithic scraper.

Such or nearly such was the aspect in which the question appeared to me at a time when I was not aware that anyone

except Mr. Harrison was fully persuaded of the human origin of the flints. The conclusion was against my previous impression, forced upon me by further consideration, so that it was with a kind of relief that I heard that Mr. Spurrell and Professor Prestwich had also accepted the implements as genuine. I have now reason to believe that their decisions, as well as Mr. Crawshay's, were made before I was aware of it, and I distinctly wish to disclaim any assertion of priority or originality, except the humble part of deciding for myself on intelligible reasons. At present the question stands on very different merits. A great variety of types has appeared, which have been detailed by Professor Prestwich, Mr. Harrison, and Mr. Crawshay, and these types, as Professor Prestwich remarks in a private letter, have not appeared as the work of Nature in any known gravel whatever, a circumstance which somewhat shifts the *onus probandi* to those who would reject them. That the flints as a class should meet with opposition when first brought before the public was inevitable; they had met the same before they were brought forward. Indeed criticism was to be desired; but that they should be rejected at a hasty glance or without full examination is neither inevitable nor desirable.

While these discoveries were "in the making," it was certainly for a long time my belief that no true palæolithic implement was found in association with the gravels in which the chipped flints appeared; that thus the chipped flints represented an age by themselves. This view proved untenable, as in the course of time a few very weathered and worn examples of definite palæolithic implements were found in the gravel-spreads. It was also my view that the drifts in which these very ochreous flints occur could be differentiated from neighbouring drifts in which rude implements were also found; so that it was with some disappointment that I found Professor Prestwich unable to take this view. Still, as has been shown above, the nature of surface finds leads us to look for various ages among them; some drifts may be older than others, and certainly the plateau contains much of later age than its earliest drifts.

What then is the conclusion? It is this; that in the ochreous drift, which can be found sticking in the edge of the broken Chalk escarpment, and traced for miles along the gently-sloping surface, man appears using the palæolithic axe, but using much more largely tools of a ruder and simpler type, which point back to a previous time when he was unable to shape his tools to a form already conceived by his mind. The axe seems to be the latest modern improvement; the others to be the survival of the usage of an earlier time. This may appear tame, but is it not as interesting as it is probable? It seems to introduce us to man of

the earliest date at which we know of his presence in our now island-area, and to represent him as a human being, very like ourselves, improving in his methods, but clinging still to the custom and wont of bygone days.

It is not right, but it is very natural to ask: What consequences will follow should the authenticity of these flints be accepted? Do they force us to believe that on the Chalk Plateau of the North Downs relics still remain of a race of mankind hitherto undiscovered? Has a rival arisen to the "indivisible supremacy" of palæolithic man? Did this ill-equipped race precede the axe-armed race, and succumb to his improved weapon? Doubtless such a view may be held, but it is by no means necessary, and rendered improbable by the occurrence of true shaped axes in the worn and ochreous drift. The argument does not seem to lead us into any sensational or disturbing conclusion, but rather to one which might have been expected. We know of early man that at an early date in Pleistocene time he was already established in a similar state of material progress, in India, in Africa, and in Western Europe. This extension in itself demands a previous human existence of immense duration. Man did not spread his dominion over three continents by steam and rail, but *pedetemptim progrediendo*; foot by foot, and field by field, the earth was won. Of man in this long epoch we know as yet nothing certain; we can only hope to learn by the discovery of human relics or tools with associated animal remains of early types. The Chalk Plateau is not likely to contain any such secret; the denudation has been so great; the formation of red clay so slow. No, not on the North Downs; perhaps in some sheltered fold of

> "Imaus,
> Whose snowy ridge the roving Tartar bounds;"

not in the Thames valley, but perchance in

> "the plains
> Of Sericana, where Chineses drive
> With sails and wind their cany waggons light,"

some happy discoverer will light upon evidence which brings us nearer to the beginnings of human existence. As yet we have a long period when man lived and spread, and we possess no knowledge either of his form or of his handiwork. Even the river-valley period was of very great duration. Sir John Evans, in his monumental work, says that "at one time I thought it probable that a marked distinction might eventually be drawn between the high and low-level implements; but, as far as Britain is concerned, this can hardly be done."[1] Here I think these dis-

[1] "Ancient Stone Implements of Great Britain," p. 616.

coveries do advance a step. The more closely the area of the Greensand and the Chalk Plateau is examined, the more firmly, I believe, will every one of Prof. Prestwich's conclusions be established —namely, that, in this area, a distinction can be drawn; three geologic stages may be traced and two archæologic stages: (1) the age of the denudation of existing river-valleys; (2) the Lower Greensand age, geologically distinct, but to the archæologist, similar, as the implements in use are of river-valley types; (3) the Chalk Plateau age, when the implements are as a whole of a ruder type; and (4) that the chipped flints are, as a class, and in their great majority, the authentic handiwork of man.

Thus the argument leads us to the verge of an epoch, which, judged by its consequence, the dispersion of mankind, must have been of longer duration than the river-valley period. Probably during this epoch, under various local influences, divers stocks of mankind grew slowly into separate races. Of this the plateau-finds—accept them in all fulness—tell us nothing; but after thinking many times, and with great and grateful consideration for any opinion of Sir John Evans, I do believe that they lift the veil for a moment beyond the time when the tools of the river-valley type were in universal use; and that Mr. Harrison, their discoverer, has, to borrow a metaphor from the neighbouring shade of the Bodleian, deciphered from the hard palimpsest of earth another page in the most interesting of all epics, the story of human life.

A CRITICAL STUDY *of the* COLLECTION *of* CRANIA *of Aboriginal Australians in the Cambridge University Museum.* By W. LAURENCE HENRY DUCKWORTH, B.A.

Material.—The number of crania is, in all, thirty-eight, and of these, twenty-nine are crania of adults, five of aged persons, and four of youths.

Sex.—Of the adults, five are females and twenty-four are males. The five aged are all males. Of the four young skulls, two belonged to youths of about eighteen to twenty years of age, one a child of seven or eight, and one a young female of about twelve or thirteen years.

INTRODUCTORY FOOTNOTE.

A description of these skulls was commenced by Prof. Macalister, and the present writer has had the benefit of Prof. Macalister's notes and measurements. The notes have been incorporated in the craniological part, and the measurements were revised and added to in the craniometrical part of the present work, which is thus an extension of that begun by Prof. Macalister.

Geographical classification.—Ten specimens are from South Australia, and with ten skulls of "Murray" natives, form a group of twenty South Australians.

Six specimens are from New South Wales and four from Victoria, two from Western Australia, one from the Northern Territory of South Australia, and one from Melbourne (but the exact locality whence the last was obtained is not recorded).

Of the source of four specimens, three of which accompany complete skeletons, there is no record.

State of preservation.—The state of preservation varies widely as may be gathered from the tables of measurement, and from the detailed descriptions of the individual specimens.

Plan of work.

Measurements were made and tabulated.

A carefully detailed description of each specimen has been written, describing the age, sex, state of preservation and appearances presented in the several *normae*: individual peculiarities were recorded. This series of descriptions follows the numerical order of the Cambridge catalogue, without regard to the grouping of the crania according to districts or tribes.

Tables I and III.

i. *Discussion of the measurements.*—These, which number about forty-six, are arranged in a table of general measurements, and the corresponding averages are arranged in another table.

Tables II and IV.

ii. For skulls upon which all the above measurements could be made, a series of thirteen indices has been made out, the number of indices varying for skulls which are not complete: the averages of these indices are arranged in a separate table.

Tables V, VI, VII.

iii. Tables of additional measurements are three in number, and comprise:

(α) Measurements of the mandible.
(β) Miscellaneous: lengths of sutures, &c.
(γ) Dimensions of teeth (two tables).

And for these the averages are arranged in the respective tables.

Tables VIII and VIIIa.

iv. Special tables present the measurements of certain groups of crania, viz., all those of South Australians; all those from New South Wales; and all those from Victoria. In these tables the indices and a limited number only of measurements will be found.

Table IX.

v. The method of seriations has been applied to the whole series of indices and to the indices of the group of South Australians. Also to a few of the principal measurements of the same.

Table X.

vi. All the averages of the measurements made have been reduced to the figures which present their relationships to the average basi-nasal length taken as 100. (This of course has already been done for the basi-alveolar length in calculating the alveolar index of the averages.) This table is divided into four columns which correspond to the four columns of the table of averages (Table III). In a subsidiary table are appended the corresponding values as calculated for series of (1) Andamanese Islanders; (2) Fijians; (3) Islanders from Torres Straits; these are taken from Sir William Flower's memoirs in the "Journal of the Anthropological Institute."

Table XI.

vii. The frequency of the occurrence of a certain number of characters such as the epipteric bone, third condyle, &c., was observed and the results have been tabulated.

Table XII.

viii. All the available figures representing the average cubic capacity, cephalic and other indices, have been brought together into one table, so that for instance the average cubic capacity is calculated from 150 cases. The authors whose memoirs have been referred to in this connection are—

Dr. Barnard Davis ("Thesaurus Craniorum").
Sir William Flower ("Journ. Anth. Inst." and "Cat. Roy. Coll. Surgeons").
Sir William Turner ("Challenger" Report).
MM. Quatrefages et Hamy ("Crania Ethnica").
M. Cauvin ("Bull. Soc. Anth. de Paris," 1883).

Table XIII.

ix. Is an additional table, which is really a seriation, and as such will be discussed with the other seriations of Table IX.

Tables XIV and XV.

x. Two skulls have been longitudinally bisected: measurements made on "rubbings" of these have been tabulated with the corresponding measurements made on rubbings of similarly bisected skulls of anthropoid apes and other animals. In the same table are the corresponding measurements made by Sir William Turner on similarly treated skulls of Australians.

N.B.—The skulls of three adults and one aged males present considerable divergences from the usual type. They will be referred to as "doubtful" skulls and the averages of the male skulls, *without* these four "doubtful" skulls, have been arranged in a special column throughout the tables.

Descriptive part.—The work has been resolved into a series of descriptions (craniological) accompanied by measurements (cranio-metrical part). Besides the detailed descriptions, a series of short notes have been written, describing individual peculiarities. From the whole series of descriptions, that of the typical skull has been deduced, and this differs in no important respect from those already published.

Measurements: Explanatory details.—Measurements were made with a craniometer (Flower's) graduated in millimètres, and with a steel tape; and the cranial capacities were estimated by using No. 8 shot, which was arranged by shaking the skull and occasional use of a wooden rammer. The mean of two observations for each specimen, not differing by more than 10 c.c., has been recorded: exceptions to this rule must be made with regard to very imperfect skulls.

Other measurements were made in the usual way. The jugo-nasal breadth and arc are measured according to the directions of Oldfield Thomas in the "Journ. of the Anth. Institute," vol. xiv. p. 333. The anterior palatine breadth is that between the roots of the canine and first premolar teeth; the posterior palatine breadth that between the first and second molar teeth. The horizontal circumference did not include the greatest prominence of the glabella.

Discussion of the tables.—Looking over the facts presented by the various tables, in Table I it may be noticed that the average cranial capacity of twenty-six specimens of both sexes is 1252 c.c. The average capacity of the male skulls is 1269·9 or 1235, according as the four doubtful skulls are included or not. These values accord fairly well with those recorded for other series (by Turner, Flower, and others).

The maximum length exceeds the ophryo-occipital length by a good deal more in the males, than in the females, and thus gives an indication of the greater and more frequent prominence of the glabella in the former sex.

The maximum breadth was usually on or about the parieto-squamous suture, but in one or two instances considerably below this.

The difference between the two sexes is clearly shown in the relative magnitudes of the bi-asterial and bi-stephanic breadths, for in the males the bi-asterial distinctly exceeds the bi-stephanic breadth, whereas in females the two are about equal, the bi-

asterial breadth in females being smaller rather than the bi-stephanic breadth being greater than in males.

As regards the measurements indicating facial breadth (*i.e.*, the external bi-orbital, bi-zygomatic, bi-malar and other breadths) the males exceed the females by very little, except in the case of the bi-zygomatic breadth; in this the difference between the sexes is pronounced, and is doubtless related to the greater mass of muscles working the lower jaw, and occupying the zygomatic fossa, of males. It must be admitted that this comparison is only drawn from *three* female skulls, but it is borne out by the dimensions of female skulls in other collections.

The bi-zygomatic, besides exceeding the other measurements of facial breadth, often nearly coincided with the maximum parieto-squamous breadth of adult males, but in the young skulls was much below that breadth. This again indicates the relative size of the masticating muscles in the two cases.

Height.—The basi-bregmatic height, in most cases, is slightly smaller than the maximum parieto-squamous breadth. This will be referred to later in connection with the group of skulls from South Australia.

The palato-maxillary length is very great in several specimens; the mean value is considerably affected by the presence of the four "doubtful" skulls.

The comparative lengths of the frontal, parietal and occipital arcs respectively are of considerable interest in view of the generalisations of M. Cauvin on this subject. ("Bulletin de la Soc. Anth. de Paris," 1883, p. 253.) This writer states that in the crania of Australians (and of Papuans and Melanesians), the parietal arc exceeds in length the frontal occipital arcs. In thirty-one specimens of both sexes described by Sir William Turner, the frontal and parietal arcs of eight (five males, three females) were almost equal in length; in twelve (eight males, four females), the frontal was in excess; in eleven (seven males, four females), the parietal was in excess of the frontal.

In the Cambridge collection, out of thirty-three skulls of both sexes, the frontal and parietal arcs of three (two males, one female) were of equal length; in fifteen cases (thirteen males, two females), the frontal exceeded the parietal; in fifteen cases (fourteen males, one female), the parietal exceeded the frontal arc.

Combining all these with the additional cases cited by Sir William Turner (in vol. ii of his report) it appears that of sixty-nine skulls of adults of both sexes, the frontal and parietal arcs are of equal length in eleven cases, the frontal is in excess in twenty-nine cases, and the parietal arc is in excess in twenty-nine cases also.

With regard to the occipital arc: in thirty-four cases out of thirty-six recorded by Sir William Turner, the parietal arc exceeded the occipital; in the remaining two (a male and a female) the occipital arc exceeded the parietal.

Of thirty-one cases in the Cambridge Museum, the parietal was greater than the occipital in twenty-nine, less in two (both males). So that in sixty-seven cases, the parietal arc exceeded the occipital in sixty-three. So that in this respect M. Cauvin's generalisation holds good.

But as regards the frontal and parietal arcs, it appears from a study of sixty-nine skulls of adults of both sexes from the Cambridge and Edinburgh collections, the two arcs are unequal nearly five times as often as not, and that when unequal the frontal arc is just as often the longer of the two as not. So that there is no confirmation of this part of M. Cauvin's statement.

Oblique parietal arc (Macalister).—Mention must here be made of the measurement called by Professor Macalister the "Oblique Parietal Arc." Its plane lies in the general direction of the fissure of Rolando. The mean value in this series is remarkable as being nearly the same for both sexes. No other large series of this measurement are as yet on record, but the following may serve as examples met with in the Cambridge collection.

Australians	343 mm.	av. both sexes.	
A Tasmanian	336 „		
N. A. Indians	365 „	av. of 3.	
Negroes	368 „	av. of 5.	
New Zealanders ..	368 „	av. of 3.	
Ancient Peruvians ..	371 „	av. of 5.	
Modern Europeans ..	370 „	av. of 2.	
Kaffirs	375 „	av. of 5.	
A Carib	375 „		
A Murray Islander ..	375 „	In the Liverpool Museum.	
An Eskimo (male) ..	384 „		

Mandible.—The mandible accompanies the cranium in eighteen specimens. The measurements show the excess of the average dimensions of the male over the female mandible. In both the coronoid and condylar heights are nearly equal; in both the intergonial exceeds the gonio-symphysial length, the excess being more pronounced in male jaws.

Average Indices.—The average indices have been calculated in two ways and the results arranged in two tables (IV, and IV*a*,) one containing the averages of the indices in distinction from the indices of the averages arranged in the other; the former

though less correct, has the advantage of admitting a greater number of instances, and the differences between the two tables will be found for the most part insignificant.

Breadth Index.—The mean breadth index of thirty-eight specimens is 70·5; of twenty-nine males 70; of five adult females 72·9. Four specimens are above the upper limit of dolicho-cephalic skulls (three males, one female); the highest individual index is 76·6, which with the second highest 76, belongs to "doubtful" skulls. Without the four doubtful specimens, the mean breadth index of twenty-five males is 69·2. The lowest index is 64·9, that of the cast of the skull of King Rufus Billy (a Murray native); though the exact state of the sutures of this scapho-cephalic specimen cannot be ascertained, the sagittal appears to be free from synostosis. The next lowest index is 65·9 (No. 2112, in which sagittal synostosis is nearly complete).

Vertical Index.—The mean vertical index of thirty-four crania is 69·6; that of twenty-six males 69·8; that of three females 68·6. The mean height of twenty-five male skulls is 130·5 mm. and their mean breadth is 132 mm.; of four females the mean height is 121 mm., the mean breadth is 128 mm. Altogether the series of skulls is dolicho-platycephalic.

Gnathic Index.—The mean gnathic index of twenty-nine skulls is 101·2, of twenty-two males 101·8, of three females 102·7. Here again the doubtful skulls disturb the average, for when excluded, it is found that the mean index of nineteen males is 102·15. The highest individual index is 108·7 (a South Australian male, No. 2115). From the averages, the whole series and the skulls of each sex fall within the mesognathous group.

Nasal Index.—The mean nasal index of thirty-two skulls was 55·6, of twenty-six males 55·4, of two females 53·25. They fall within the platyrhine group. The highest individual index is 65·1, and one of the "doubtful" skulls possesses the lowest nasal index of the series, viz., 47·4.

Orbital Index.—The mean orbital index of thirty-one skulls is 82·6: that of twenty-four males 81·2; of three females 87·4; accordingly the males are microseme, the females mesoseme. One of the doubtful skulls has an index of 92·7: after exclusion of the four doubtful skulls the mean index for twenty males is 80·5.

Palato-Maxillary Index.—The mean palato-maxillary index of twenty-nine skulls is 111·7; of twenty-two males 110·4; of three females 112·6. Among the males, in four cases a low palato-maxillary index is associated with a high degree of prognathism, the two most pronounced cases being

Skull.	Palato-maxillary Index.	Gnathic Index.
No. 2115	101·5	108·7
„ 2127	92·2	107·1

On the other hand the very dolichuranic skull No. 2140 with an index of 97 has a gnathic index of but 100.

Palate Length.—It might be mentioned in this connection that the comparatively low palato-maxillary index in many Australian crania is due to excessive length rather than reduced breadth; but this palatine length is much increased in many cases by a large tuber maxillare; herein, it is thought, lies a difference between these crania and the dolichuranic crania of anthropoid apes; for in the latter (in the majority of instances, so far available) the maxillary tuberosity is frequently quite insignificant and does not add to the palatine length, so that in this respect the palate of anthropoid apes resembles that of the more highly civilised races of man rather than the aboriginal Australian.

Total Facial Index.—The figures for the total facial index do not accord very well with those published by Dr. Topinard ("Et. d'Anth. Gén.," p. 919), where 107·2 is given as the mean index of seven Australians. In the Cambridge collection the mean index of fourteen skulls is 95·4, of ten males 96·2, of two females 93·6; and in the whole series two males out of ten only have indices above 100. The general indication then is of a longer face than that of the Australians referred to by Topinard. For the superior facial index of Broca, nineteen skulls give an average of 73·4, thirteen males of 73·7, three females 74·1. Topinard, quoting Broca's figures, gives 69·7 as the mean of twenty-seven Australians. Sir William Turner's "Challenger" Report contains figures which give 65·1 as the mean index of twenty-eight skulls. Both these observations denote faces shorter than those of the skulls in the Cambridge collection. Sir William Turner's series contained only three skulls from South Australia, whereas the majority of the skulls here described are from that district, and none of these presents an index below 71.

Facial Indices.—It might be supposed that this is a feature characteristic of skulls from South Australia, but it must be admitted that no great reliance can be placed on such an index as this, depending as it does on the position of the ophryon. The superior facial index of Kollmann avoids this difficulty, and it is interesting to find that here again the indices of the skulls

at Cambridge indicate a longer face on the average than do the indices calculated from the data furnished by Sir William Turner in the memoir already referred to. (Thus, the mean index of twenty-one skulls is 51·7, of fifteen males 51·8, of two females 54. Turner's figures give 48·8 as the average of thirty-three skulls, of twenty-one males 48·6, of nine females 48·9. Again the average index of eleven skulls from South Australia in the Cambridge collection is 52·2.) To sum up the facts presented by these facial indices. From three facial indices evidence appears that the skulls in the Cambridge collection, in which South Australians predominate, have a proportionally longer face than those from other districts. The relation of this feature to prognathism cannot be overlooked, and perhaps the difference between the South Australians and other series may be too slight to warrant any conclusions being drawn; but the recurrence of the same difference in three indices respectively, is remarkable.

The average stephano-zygomatic index (of Topinard) indicates that the skulls are highly phaenozygous, the males more so than the females. (Average index of twenty-one skulls is 79·9, of fifteen males 76·5, of three females 81·9.) The mean gonio-zygomatic index of fifteen skulls is 72·9, which agrees fairly well with the figure quoted by Topinard, viz., 75·5 as the average of four Australians.

Naso-Malar Index.—The naso-malar index is of considerable interest owing to the small range of variation throughout this series. The range through twenty-seven skulls is less than 7 units (the range of the cephalic index through twenty-nine males being nearly 12 units). The average index of thirty skulls is 111·4, of twenty-three males 111·2, of three females 110·4. In his paper in the "Journal of the Anthropological Institute," vol. xiv, p. 333, Oldfield Thomas gives 111·1 as the mean index of sixteen Europeans. One would expect the average value for the modern European skull to be somewhat greater than this, or else that of the aboriginal Australian to be somewhat lower.

Dental Index.—The mean dental index of thirteen skulls is 45·2, of eight males (excluding the doubtful ones) 45·8, of two females 49·25. The fact of the female sex possessing the higher index agrees with the figures recorded by Sir William Flower, viz., 44·8 as the average of twenty-two males, 46·1 the average of fourteen females. The relatively smaller basi-nasal length in the latter sex probably is the cause of this apparent discrepancy.

Table VI.

Of the tables of additional measurements but little can be said at present. With regard to the dimensions of the posterior

nares, it may be remarked that while the breadths are nearly equal, the height is only one-half that of the apertura pyriformis of the nose.

The average least distance of the temporal crests is 87·5 mm. (for twenty-two males), and in three females they did not approach nearer than 106 mm.

Teeth.—As regards the dimensions of the teeth, the combined lengths of the lower molars exceed those of the upper set, and the same relation holds good for the combined lengths of molars and premolars. This confirms the statements of Professor Turner in the "Journal of Anatomy and Physiology," vol. xxv, p. 461. With regard to other statements in the same paper, viz., those referring to the apposition of the teeth, the confirmation is not so clear. Professor Turner makes the statement concerning a skull from South Australia, that the two sets of teeth are in contact by their cutting edges "when the condyles of the lower jaw were articulated, and placed in contact with the ridge that bounded the back of the glenoid fossa, and the teeth clenched."

The following specimens at Cambridge were available for examination with regard to this point, and the following notes present the results of such an investigation:—

No. 2,101. South Australia (a cast and not the original skull).

When the condyles rest in the glenoid fossa, no such apposition as was described is observed; on placing the mandible in such a position that apposition occurs, it is found that the condyle is resting on the rounded *anterior* border of the glenoid fossa formed by the anterior root of the zygoma. This might well be the position in life, as room would be afforded for the interarticular cartilage.

No. 2,115. South Australia, male.

The lateral superior and two left lower incisors only persist. On placing the jaw in the desired position firmly, the condyles are found *not* to be in contact with any part of the floor or boundaries of the glenoid fossa, being separated by an interval of less than 1 mm., which was presumably occupied by the interarticular cartilage.

No. 2,128. South Australia, male.

Arrangement very similar to No. 2,115, but the right condyle just touches the anterior border of its glenoid cavity.

No. 2,137. When the mandible is placed in the position in which the incisors bite surface to surface, a considerable area of the condyles is found to touch the glenoid fossa. It is here to be remarked that the glenoid fossa of this specimen are very shallow and flattened, the flattening being most pronounced in the region of the anterior border of the cavity, so that the

anterior root of the zygoma is indistinct. It is submitted that such a shallow glenoid fossa is an approach to a state that is usual in anthropoid apes. (Among Australian crania Nos. 2,138, 2,139 and 2140, exhibit the same feature in a less marked degree.) But even here the condyles are not touching the back of the glenoid fossa when the teeth are in apposition.

No. 2,138. Approaches most nearly to the state of affairs described by Sir William Turner. Apposition still occurs when the condyles are in the posterior part of the glenoid fossa.

Nos. 2139 and 2140. Give no very definite evidence, but it seems as if the condyle must occupy an *anterior* position in the glenoid fossa in order that the teeth may be in apposition. The influence of the size of the interarticular cartilage in determining this position has been hinted at by Topinard ("L'Anthropologie," 1892). With regard to the occurrence of this apposition of incisors in races other than Australian, Sir William Turner remarks that he had observed it in a Malay, a Bushman and an Esquimaux, while in 1860 Sir John Lubbock wrote in an account of the Danish kitchen-middens (in the "Natural History Review"), "the tumuli have supplied us with many skeletons of this period . . . . one curious peculiarity is that their front teeth did not overlap as ours do, but met one another, as do those of the Greenlanders at the present day. This evidently indicates a peculiar manner of eating."

Further with regard to the occurrence in prognathic or orthognathic skulls, it may be mentioned that the same arrangement was observed in a very orthognathic skull dug up at Chester, during the last few months. It must be added that this specimen gave signs of deformation (though not posthumous) which may be responsible for the appearance of orthognathism.

The group from South Australia.—Table VIII exhibits the indices and a few of the principal measurements of the group of skulls from South Australia, which form so large a proportion of the Cambridge collection. The chief point of interest is in the relative magnitudes of the cephalic and altitudinal indices. Considering averages, the breadth index is 70·2; the height index 68·9; the average skull is therefore dolicho-platycephalic. As regards the sexes, the mean breadth index of fifteen males is 69·6, the mean height index of twelve males is 69·15 (no appreciable difference); the three females, however, have a breadth index of 71·4 and a mean height index of 65·2, and so are very dolicho-platycephalic. Regarding now individual indices, the results as regards the males are different. In thirteen cases out of seventeen, the height index was less than the breadth index (of these, nine were males, three females, one

a youth). Sir William Turner says that of twenty-two crania from South Australia which he examined, seventeen had a lower height index than breadth index. This is exactly the same proportion as in the Cambridge collection. Combining the two sets of data, from a total of thirty-nine crania from South Australia, thirty are dolicho-platycephalic (nineteen males, ten females, and a youth); in two, the two indices are equal; in seven males the height index exceeds the breadth index.

As regards other indices, the gnathic is somewhat higher in this group than in the whole series and the facial indices, as has been said, show a longer face to exist in this collection than in the skulls from other districts. With regard to the frontal, parietal and occipital arcs, their relative lengths are much the same as in the whole series. (Combining the measurements given by Sir William Turner of South Australian skulls, with those in this collection, it appears that of twenty-three skulls, in three the frontal and parietal arcs are equal, in nine the parietal arc is the greater, in eleven the frontal, the occipital exceeding the parietal in two cases, and the frontal in one.) From this review of the features of crania from South Australia, it must be admitted that no other striking feature other than the occurrence of dolicho-platycephalic skulls, distinguishes them from aborigines from other districts. At the same time there is a slight difference in their facial indices, which may also prove distinctive.

Groups from New South Wales and Victoria.—The Table VIII*a* refers to the measurements of the groups of skulls from New South Wales and Victoria respectively; they do not contain sufficiently large numbers to justify any general conclusions.

Seriations.—Table IX. The method of seriation of characters has been applied in many cases without modifying the value of the averages as already calculated. There is, however, one notable exception, viz., the vertical or height index of the group of crania from South Australia. By examining the factors of this index, the basi-bregmatic height was found to be the disturbing element, and in consequence its seriation was carefully studied, figures relating to twelve well-authenticated male skulls being used. (Average height = 129·25 mm.) In forming a seriation with 5 units as its modulus, it was found that the crania fall into two groups almost symmetrically arranged with regard to the average figure, the groups being characterised by basi-bregmatic heights greater or less than about 129 mm. respectively.

The small number of skulls renders this statement somewhat unimportant. By collecting all available data, the total number of adult male South Australian skulls was raised to twenty-four; and in a similar seriation the same grouping is again observed,

while it is much more marked when the modulus is 2 units (the diminution in this respect being justified by the increased number of specimens under consideration).

It may be urged that the choice of the modulus (2 or 5) whereby these features were brought out, was quite arbitrary, and this indeed is the case. It seemed then that a modulus of a different dimension should be taken and as in the actual measurements, no less difference than 1 millimetre is taken account of, the choice of unity as modulus would be somewhat less arbitrary. Arranged in seriation thus the arrangement is somewhat obscure, and if plotted out in the form of a curve, the curve is now discontinuous, whereas with 2 as the modulus it was quite graphic. Still a trace of the same arrangement remains and the whole subject is thought worthy of notice.

The interest of this double grouping lies in the fact that according as a skull falls within one or the other group, so it is (at any rate in 80 per cent. of cases) dolicho-platycephalic, or the reverse.

If the race were homogeneous, one would expect the curve of the number of examples to rise gradually, attaining its maximum at the average (*a*),

whereas in the case of these male South Australians the curve occurs to be of this sort (*b*),

two groups being observed. It seems then as if the dolicho-platycephalic individuals form a section only of the natives of South Australia. The number of cases (24) here considered is perhaps small, but the constant way in which the double maximum has been seen, first with twelve cases, then with twenty-four, warrants some amount of attention being paid to this method of grouping. At any rate if confirmed it would be a very graphic indication of the mingling of two types, and this is perhaps not far removed from what might be expected in the case of the South Australians, where an admixture of a Melanesian with a Tasmanian element is already suspected. To sum up, while the average male skull from South Australia is feebly dolicho-platycephalic, a study of individuals shows that few present this characteristic of the average skull, and that in fact they are either distinctly dolicho-platycephalic, or decidedly

hypsi-cephalic. If both these types were met with in equal frequency, the average skull would have breadth and height indices equal. Actually, however, for twenty-four male skulls examined, the decidedly dolicho-platycephalic class are somewhat in excess of the decidedly hypsi-cephalic class (viz., 14 : 10) so that the average skull turns out to be as already said, feebly dolicho-platycephalic.

At the risk of rendering this discussion tedious, it must be said that the fact of a *single* character being the basis of an argument affecting the race, was considered unsatisfactory, and it was thought that some confirmation of the groupings ought to be obtained from a study of other characters. At first, a number of seriations were made out for other characters, and it may be said at once, without any evidence of a decided nature being brought out. Next the specimens were arranged in order of size, as regards indices and several dimensions. This is in fact another kind of seriation. The difficulty occurred that among the twenty-four skulls the differences between the third, fourth, and fifth, for instance, with regard to any character (*e.g.*, maximum length), might be much less than the differences between the twenty-second, twenty-third, and twenty-fourth in order. So that this table proved somewhat fallacious and certainly unwieldy.

Accordingly a modification was introduced (and I am much indebted to my friend Mr. P. E. Bateman, of Jesus College, for aid in this arrangement) whereby the range of variation in the magnitude of each measurement or index was divided into six equal portions (the number six happened to be convenient, but is quite arbitrary), and all skulls whose dimensions placed them in the same division were regarded as occupying the same place in the order of the specimens. Thus there might be two specimens in the first rank, five in the second, and so on. Table XIII presents the arrangement.

With such an arrangement, one would expect to find differences emphasized, if any exist. Also the curves corresponding to the figures would be expected to show signs of groups, if such are present. But as a matter of fact this particular arrangement does not admit of any statement as to groups being made, and the corresponding series of curves indicates a *double grouping in the case of basi-bregmatic height*, but in this alone, among the most important measurements studied. Next the corresponding set of figures was worked out for the *average* South Australian (as inferred from average dimensions) and the average Tasmanian. A comparison of these with each other, and with the individual South Australians, has so far only resulted in showing that one skull from South Australia (No. 2,114), besides its superficial

appearance, is in proportions nearly allied to the *average* Tasmanian type. As the whole of this method of seriations aims at the bringing forward of the individual characters, rather than those of the hypothetical average skull, no great importance ought to be attached to the last observations. It is very probable that when tables similar to Table XIII have been made out for an equal number of individuals from Tasmania on the one hand, and other districts in Australia on the other, important results may accrue.

Measurements in terms of Basi-nasal lengths.—Passing to Table X. Here are arranged the principal measurements expressed in terms of the basi-nasal length. They have thus most interest in comparison with other groups of crania whose measurements have been similarly modified. Such are the groups of Andamanese Islanders and Fiji Islanders in the memoirs of Sir William Flower, and the group of Torres Strait Islanders described by Oldfield Thomas, in the "Journ. of the Anthrop. Inst." Table Xa. Adult males of these groups are arranged in a comparative table, with the adult male Australians. The most striking features are these: the micro-cephalic character of Australians is emphasized; the basi-bregmatic heights of Australians and Fijians contrast strongly (the latter being the higher of the two), the Torres Strait Islanders hold an intermediate position in this respect. The small bi-auricular breadth of Australians is to be noticed as well as in the relative lengths of frontal and parietal arcs, where again there is no confirmation of the statement that the parietal arc is the greater in Australians. The basi-alveolar length has been discussed as the gnathic index; here it shows a less prognathic face than those of Fiji or Torres Strait Islanders.

Concluding Tables.—In concluding this paper, attention is directed to the table which gives the averages of several indices as collected from all available sources, notably the average breadth index of 214 skulls of both sexes being 70·95, the average height index from 171 skulls being 71·5. Finally the Table XI presents details of an anatomical nature referring to the occurrence of what are regarded as anomalies in European crania; possibly the traces of a third occipital condyle and of a divided occipital bone are the most significant.

The Tables XIV and XV having reference to measurements made on rubbings of longitudinally bisected skulls of Australians, Europeans, and also of apes and lower animals, are of considerable interest which is of a general zoological nature, rather than anthropological. These measurements will therefore be considered apart.

Number of Skull.	*2101*	*2102*	*2104*	*2105*	*2106*	*2107*	*2108*	*2112*	*2113*	*2114*
Age	Adult.	Adult.	Adult.	Adult.	Adult.	Aged.	Adult.	Adult.	Adult.	Aged.
Cubic capacity	(?)	1155	1080	1368	(?)	(?)	(?)	(?)	1340	1275
Maximum length	202	181	175	191	186	193	187	182	189	185
Ophryo-iniac length	195	173	166	180	170	185	174	174	186	173
Ophryo-occipital length	194	175	173	190	180	189	184	178	185	178
Maximum breadth	131	127	128	135	132	132	137	120	130	139
Bi-asterial breadth	119	106	104(?)	110	108	108	112	101(?)	114	108
Bi-stephanic breadth	99	107	96	109	111	93	107	77	95(?)	103
Bi-auricular breadth	117	110	112	115	(?)	114	115	112(?)	112	117
Minimum frontal breadth	93	93	89	101	97	102	104	79	88	95
External bi-orbital breadth	120	108	97	110	111	110	111	105	108	109
Bi-zygomatic breadth	140	(?)	126(?)	132(?)	(?)	(?)	(?)	(?)	132	133(?)
Bi-malar breadth	128	117	(?)	119	(?)	(?)	(?)	(?)	121	116
Bi-maxillary breadth	102	91	87	95	(?)	(?)	(?)	(?)	103	87
Jugo-nasal breadth	117	99	(?)	97	(?)	(?)	(?)	(?)	101	99
Naso-mental length	121	117	(?)	113	(?)	(?)	(?)	(?)	(?)	(?)
Ophryo-alveolar length	102	94(?)	88(?)	82(?)	(?)	(?)	(?)	83(?)	105(?)	90(?)
Naso-alveolar length	73	71	60	63	(?)	(?)	(?)	60(?)	73	59(?)
Basi-alveolar length	(?)	111	96	107	(?)	(?)	(?)	95(?)	106	99(?)
Basi-nasal length	(?)	103	93	101	(?)	101	(?)	99	106	93
Basi-bregmatic length	(?)	131	123	132	136(?)	126	(?)	135	139	123
Basion to obelion, length..	(?)	122	118	124(?)	(?)	117	(?)	128	127	119
Basion to lambda, length..	(?)	112	109	113	(?)	113	(?)	116	113	110
Basi-iniac length	(?)	75	73	70	(?)	83	(?)	80	87	81
Basion to opisthion, length	(?)	34	34	34	(?)	35	(?)	38	34	35
Breadth of foramen magnum	(?)	31	32	31	(?)	29	(?)	33	31	31
Orbital height	35	33	31	32	(?)	(?)	(?)	(?)	33	32
Orbital breadth	45	42	36	41	(?)	(?)	(?)	(?)	39	38
Nasal height	50	50	47	49	(?)	(?)	(?)	46	49	43
Nasal breadth	32	26	25	26	(?)	(?)	(?)	25	25	28
Palato-maxillary length	68	65	54	63	(?)	(?)	(?)	58(?)	62	(?)
Palato-maxillary breadth	70	70	61	63	(?)	(?)	(?)	57(?)	71	(?)
Arcs: Frontal	146	125	116	134	128	129	128	120	129	127
Parietal	128	121	118	128	145	129	128	124	131	126
Occipital: to inion	65	60	70	84	63	72	73	65	58	62
Occipital: In. to opisthion ..	35	45	44	37	45	51	(?)	46	56	47
Supra-auricular	300	291	280	307	(?)	284	295	(?)	296	300
Oblique parietal	345	331	333	356	(?)	326	350	(?)	342	355
Jugo-nasal	129	112	(?)	108	(?)	(?)	(?)	(?)	112	110
Horizontal circumference..	539	492 (507)	489	530	503	522	524	494	524	511
Anterior palatine breadth	27(?)	33	28	30	(?)	(?)	(?)	28	32	29
Posterior palatine breadth	38(?)	46	37	37	(?)	(?)	(?)	34	49	40
Minimum interorbital breadth	30	25	24	24	25	(?)	(?)	24	28	24
Occipito-spinal length	210	198	185	196	(?)	(?)	(?)	188	194	192
Occipito-alveolar length	220 (?)	210	194	203	(?)	(?)	(?)	188(?)	201	201(?

TABLE I.—PRINCIPAL MEASUREMENTS.

Males.

13	2114	2115	2117	2118	2119	2122	2123	2125	2126	2127	2128	2129	2131	2133	2134
ult.	Aged.	Adult.	Adult.	Adult.	Aged.	Adult.	Aged.	Aged.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.
0	1275	1190	1300	1225	1183	1348	1230	1508	1025	1020	1135(?)	1300(?)	1535	1555(?)	1360
9	185	193	187	193	183	188	187	195	175	183	188	193	190	183	184
6	173	182	181	186	173	185	181	182	168	179	174	188	185	183	170
5	178	187	183	184	177	185	186	190	173	178	181	190	186	183	183
0	139	130	129	131	127	135	134	139	118	124	126	128	142	139	141
4	108	109	106	109	99(?)	110	118	116	97	104	107	111	114	108	110
5(?)	103	105	103	95	98	107	115	112	94	99	94	101	108	109	113
2	117	112	119	119	113	118	112	118	106	109	111	117	121	122	116
8	95	97	93	90	91	103	98	91	89	93	91	99	97	97	103
8	109	107	103	105	108	112	109	104	102	106	104	112	110	108	110
2	133(?)	127	133(?)	136	131(?)	133	135	128(?)	124	123	132	(?)	137	145	134
1	116	114	115	120	119	122	119	120	113	109	115	(?)	122	123	114
3	87	90	87	97	95	94	93	96	90	82	94	(?)	103	98	94
1	99	100	98	101	102	104	102	100	97	102	99	(?)	103	102	103
?)	(?)	115	(?)	(?)	88(?)	(?)	(?)	(?)	(?)	(?)	111	(?)	121	116	112
5(?)	90(?)	97	98	97	93(?)	96	90	100(?)	90(?)	99	96	(?)	103	100	93
3	59(?)	69	70	64	67(?)	66	66	65	62	72	67	(?)	73	75	65
6	99(?)	112	104	101	110(?)	98	95	100	96	106	103	(?)	110	(?)	98
6	93	103	100	101	104	102	100	100	97	99	103	105	110	(?)	99
9	123	122	138	125	128	132	129	132	133	123	125	132	137	(?)	130
7	119	118	134	119	118	125	120	130	128	121	127	130(?)	134	(?)	128
3	110	115	122	109	119	112	111	122	113	112	119	116	122	(?)	115
7	81	84	88	87	78	90	79	85	71	88	77	89	85	(?)	73
4	35	31	37	35	40	34	34	36	30	34	34	41	36	(?)	37
1	31	25	29	29	30	29	25	29	25	31	26	32	30	(?)	33
3	32	33	33	35	32	31	34	31	31	32	32	(?)	33	36	38
9	38	39	39	41	43	44	42	40	39	40	40	(?)	42	40	41
9	43	49	49	48	51	51	51	46	43	49	50	(?)	57	54	50
5	28	25	25	30	32	28	29	27	25	26	25	(?)	27	27	27
2	(?)	65	60	56	(?)	53	53	57	55	64	59	(?)	59	55	56
1	(?)	66	65	63	(?)	68	67	63	63	59	64	(?)	67	64	63
9	127	126	128	134	119	134	130	124	119	115	115	132	131	132	117
1	126	120	134	131	122	122	130	145	125	132	128	135	124	128	130
8	62	65	61	55	65	55	67	71	72	55	72	57	68	79	78
6	47	57	54	57	43	61	47	52	42	57	44	54	59	(?)	39
6	300	283	295	280	292	310	304	309	282	279	288	295	315	318	292
2	355	344	356	345	340	346	344	357	323	338	341	343	380	365	346
2	110	111	108	111	114	116	113	114	109	110	108	(?)	114	116	113
4	511	512	507	517	500	523	519	535	475	498	506	525	532	515	520
2	29	29	31	27	34	30	29	28	29	28	27	(?)	31	30	27
9	40	39	39	40	42	45	45	43	42	35	41	(?)	47	42	43
8	24	24	22	25	27	28	25	25	26	24	25	26	27	26	25
4	192	205	197	188	195(?)	194	190	202	182	193	201	(?)	210	179	193
1	201(?)	219	209	192	207(?)	197	193	212(?)	191	205	210	(?)	216	182	200

TABLE I.—PRINCIPAL MEASUREMENTS.

Males.

2119	*2122*	*2123*	*2125*	*2126*	*2127*	*2128*	*2129*	*2131*	*2133*	*2134*	*2136*	*2137*	*2138*
Aged.	Adult.	Aged.	Aged.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult.	Adult
1183	1348	1230	1508	1025	1020	1135(?)	1300(?)	1535	1555(?)	1360	(?)	1165	1253
183	188	187	195	175	183	188	193	190	183	184	195	180	190
173	185	181	182	168	179	174	188	185	183	170	178	177	183
177	185	186	190	173	178	181	190	186	183	183	189	176	182
127	135	134	139	118	124	126	128	142	139	141	139	125	133
99(?)	110	118	116	97	104	107	111	114	108	110	105(?)	98	111
98	107	115	112	94	99	94	101	108	109	113	104	95	89
113	118	112	118	106	109	111	117	121	122	116	114(?)	106	117
91	103	98	91	89	93	91	99	97	97	103	99	80	87
108	112	109	104	102	106	104	112	110	108	110	110	103	106
131(?)	133	135	128(?)	124	123	132	(?)	137	145	134	130(?)	124	130
119	122	119	120	113	109	115	(?)	122	123	114	121	110	114
95	94	93	96	90	82	94	(?)	103	98	94	97	93	93
102	104	102	100	97	102	99	(?)	103	102	103	107	94	100
88(?)	(?)	(?)	(?)	(?)	(?)	111	(?)	121	116	112	(?)	108	109
93(?)	96	90	100(?)	90(?)	99	96	(?)	103	100	93	105	105	100
67(?)	66	66	65	62	72	67	(?)	73	75	65	70	69	63
110(?)	98	95	100	96	106	103	(?)	110	(?)	98	99	105	101
104	102	100	100	97	99	103	105	110	(?)	99	100	101	103
128	132	129	132	133	123	125	132	137	(?)	130	134	132	136
118	125	120	130	128	121	127	130(?)	134	(?)	128	130	128	129
119	112	111	122	113	112	119	116	122	(?)	115	120	112	118
78	90	79	85	71	88	77	89	85	(?)	73	77	74	82
40	34	34	36	30	34	34	41	36	(?)	37	34	33	37
30	29	25	29	25	31	26	32	30	(?)	33	27	28	32
32	31	34	31	31	32	32	(?)	33	36	38	35	29	33
43	44	42	40	39	40	40	(?)	42	40	41	43	38	43
51	51	51	46	43	49	50	(?)	57	54	50	52	47	45
32	28	29	27	25	26	25	(?)	27	27	27	30	27	26
(?)	53	53	57	55	64	59	(?)	59	55	56	57	59	60
(?)	68	67	63	63	59	64	(?)	67	64	63	66	59	66
119	134	130	124	119	115	115	132	131	132	117	136	130	128
122	122	130	145	125	132	128	135	124	128	130	131	122	124
65	55	67	71	72	55	72	57	68	79	78	75	68	72
43	61	47	52	42	57	44	54	59	(?)	39	45	43	48
292	310	304	309	282	279	288	295	315	318	292	308(?)	291	293
340	346	344	357	323	338	341	343	380	365	346	362(?)	346	347
114	116	113	114	109	110	108	(?)	114	116	113	118	104	114
500	523	519	535	475	498	506	525	532	515	520	530	488	512
34	30	29	28	29	28	27	(?)	31	30	27	29	30	29
42	45	45	43	42	35	41	(?)	47	42	43	45	36	41
27	28	25	25	26	24	25	26	27	26	25	24	23	25
195(?)	194	190	202	182	193	201	(?)	210	179	193	198	192	193
207(?)	197	193	212(?)	191	205	210	(?)	216	182	200	208	199	199

				Females and Youths.								
137	*2138*	*2139*	*2140*	*2135*	*2103*	*2110*	*2120*	*2121*	*2124*	*2130*	*2132*	*2111*
dult.	Adult.	Adult.	Adult.	Youth.	Adult.	Adult.	Adult.	Adult.	Age 12.	7 or 8.	Adult.	Young Adult.
65	1253	1445	1393	1160	(?)	1138	(?)	1075(?)	1243	1240	1210	1165
80	190	192	194	174	177	180	175	177	173	176	176	183
77	183	186	187	169	(?)	175	170	174	171	167	174	179
76	182	190	190	174	(?)	178	175	175	173	176	176	180
25	133	140	137	130	126	127	124	128	127	123	134	129
98	111	110	114	105	101	107	104	101	108	105	106	103
95	89	118	101	109	103(?)	100	107	97	104	105	107	93(?)
06	117	116	122	106	110	112	102(?)	106	100	102	110	108
80	87	104	97	97	91	95	90(?)	88	91	92	99	96
03	106	110	115	103	105	105	(?)	103	96	95	109	106
24	130	138(?)	141	117	(?)	123	(?)	123	108	110	125	123(?)
10	114	120	126	105	(?)	110	(?)	108	95	98	118	114
93	93	95	97	82	(?)	90	(?)	90	78	76	101	95
94	100	103	107	98	(?)	103	(?)	95	86	90	103	100
08	109	112	115	(?)	(?)	110	(?)	(?)	95	90	107	(?)
05	100	94	98	82	(?)	89	(?)	89	76	82	97(?)	92
69	63	68	68	55	(?)	65	(?)	68	55	56	65(?)	63
05	101	105	109	91	(?)	103	(?)	96	82	85	92	95
01	103	104	109	95	(?)	99	96	92	84	91	94	94
32	136	132	134	134	124(?)	127	115	115	118	122	126	118
28	129	124	131	128	(?)	122	111	115	120	123	123	117
12	118	112	120	111	(?)	109	100	110	109	120	110	107
74	82	76	86	77	(?)	82	72	89	86	75	81	84
33	37	37	38	31	(?)	33	29	33	35	33	33	34
28	32	30	30	27	(?)	28	27	26	25	28	29	28
29	33	36	33	32	(?)	37	(?)	35	31	34	31	37
38	43	41	42	41	(?)	41	(?)	37	37	37	40	39
47	45	49	52	45	(?)	45	(?)	49(?)	41	39	47(?)	45
27	26	30	27	27	(?)	25	(?)	25	23	21	28	28
59	60	59	67	52	(?)	57	(?)	54	45	45	57	55
59	66	65	65	61	(?)	63	(?)	63	56	55	63	62
30	128	133	125	127	115(?)	126	118	114	124	118	132	130
22	124	138	130	127	117(?)	124	128	114	131	124	120	127
68	72	71	66	57	55(?)	53	59	54	46	67	59	54
43	48	40	51	49	(?)	51	46	60	55	44	53	54
91	293	310	292	305	272(?)	278	284(?)	272	287	278	303	277
46	347	355	350	339	321(?)	344	330(?)	344	340	326	346	342
04	114	115	120	111	(?)	114	(?)	106	95	105	112	112
88	512	540	528	486	490	495	481	490	483	485	500	505
30	29	33	29	31	(?)	28	(?)	29	26	32	27	27
36	41	43	39	39	(?)	38	(?)	41	31	34	39	38
23	25	28	29	24	(?)	27	(?)	24	21	23	27	28
92	193	200	209	183	(?)	191	(?)	190	179	177	178	185
99	199	207	215	189	(?)	200	(?)	200	183	182	190	193

Number of skull	*2101*	*2102*	*2104*	*2105*	*2106*	*2107*	*2108*	*2112*	*211*
Index, Cephalic	64·9	70·2	73·1	70·7	71	68·4	73·3	65·9	68
„ Vertical	(?)	72·4	70·3	69·1	73·1 (?)	65·3	(?)	74·2	73
Alveolar	(?)	107·8	103·2	105·9	(?)	(?)	(?)	(?)	100
Orbital	77·8	78·6	86·1	78	(?)	(?)	(?)	(?)	84
Nasal	64	52	53·2	53·1	(?)	(?)	(?)	54·3	51
Palato-maxillary	102·9	107·7	113	100	(?)	(?)	(?)	(?)	114
Facial (total)	87·5	(?)	(?)	95·7 (?)	(?)	(?)	(?)	(?)	(?)
Facial, superior (Broca) ..	72·85	(?)	(?)	(?)	(?)	(?)	(?)	(?)	79·5
Facial, superior (Kollmann)..	52	(?)	47·6 (?)	47·7 (?)	(?)	(?)	(?)	(?)	55
Stephano-zygomatic	70·7	(?)	76·2 (?)	82·6 (?)	(?)	(?)	(?)	(?)	72
Gonio-zygomatic	72·1	(?)	(?)	82·6 (?)	(?)	(?)	(?)	(?)	(?)
Naso-malar (Oldfield Thomas)	110·25	113·1	(?)	111·3	(?)	(?)	(?)	(?)	110
Dental (Flower)	(?)	(?)	(?)	47·5	(?)	(?)	(?)	(?)	(?)

	Males.								
Number of skull	*2128*	*2129*	*2131*	*2133*	*2134*	*2136*	*2137*	*2138*	*213*
Index, Cephalic	67	66·3	74·7	76	76·6	71·3	69·4	70	72
„ Vertical	66·5	68·4	72·1	(?)	70·7	68·7	73·3	71·6	68
Alveolar	100	(?)	100	(?)	99	99	104	98·1	101
Orbital	80	(?)	78·6	90	92·7	81·4	76·3	76·7	87
Nasal	50	(?)	47·4	50	54	57·7	57·4	57·8	61
Palato-maxillary	108·5	(?)	120·3	116·4	112·5	115·8	100	110	110
Facial (total)	97·8	(?)	94·5	105·5	99·3	(?)	89·2	94·2	99·3
Facial, superior (Broca) ..	72·7	(?)	75·2	69·65	69·4	80·75(?)	84·7	76·9	68·1
Facial, superior (Kollmann)..	50·75	(?)	53·3	51·7	48·5	53·8 (?)	55·6	48·5	49·3
Stephano-zygomatic	71·2	(?)	78·8	75·2	84·3	80 (?)	76·6	68·5	85·5
Gonio-zygomatic	70·45	(?)	72·3	77·9	71·6	(?)	75	71	69·6
Naso-malar (Oldfield Thomas)	109·1	(?)	110·7	113·7	109·7	110·3	110·6	114	111
Dental (Flower)	45·6	(?)	33·6	(?)	44·5	(?)	42·7	44·7	49·3

Males.

2112	2113	2114	2115	2117	2118	2119	2122	2123	2125	2126	2127
65·9	68·8	75·1	67·4	69	67·9	69·4	71·8	71·7	71·3	67·4	67·8
74·2	73·5	66·5	63·2	73·8	64·8	69·9	70·2	69	67·7	76	67·2
(?)	100	106·5	108·7	104	100	105·8	96·1	95	100	99	107·1
(?)	84·6	84·2	84·6	84·6	85·4	74·4	70·5	81	77·5	79·5	80
54·3	51	65·1	51	51	62·5	62·7	54·9	56·9	58·7	58·1	53·1
(?)	114·5	(?)	101·5	108·4	112·5	(?)	128·3	126·4	112·3	114·5	92·2
(?)	(?)	(?)	92	(?)	(?)	(?)	96·4	(?)	(?)	(?)	(?)
(?)	79·5 (?)	(?)	76·4	73·7 (?)	71·3	(?)	72·2	66·7	(?)	72·6 (?)	80·5
(?)	55·3	(?)	54·3	52·6	47·1	(?)	49·6	48·9	50·8	50 (?)	58·5
(?)	72 (?)	(?)	82·7	77·4 (?)	69·9	74·8	82	85·2	87·5 (?)	75·8	80·5
(?)	(?)	(?)	65·35	(?)	(?)	74	71·4	(?)	(?)	(?)	(?)
(?)	110·9	111·1	111	110·2	109·9	111·8	111·5	110·8	114	112·4	107·8
(?)	(?)	(?)	49·5	46	41·6	(?)	(?)	(?)	(?)	(?)	43·4 (?)

			Females.					Youths.			
2138	2139	2140	2103	2110	2120	2121	2132	2111	2124	2130	2135
70	72·9	70·6	71·2	70·6	70·9	72·3	76·1	70·5	73·4	69·9	74·7
71·6	68·8	69·1	70·1	70·6	65·7	65	71·6	64·5	68·2	69·3	77
98·1	101	100	(?)	104	(?)	104·3	97·9	101·1	97·6	93·4	95·8
76·7	87·8	78·6	(?)	90·2	(?)	94·6	77·5	94·9	83·8	91·9	78
57·8	61·2	51·9	(?)	55·5	(?)	51	59·6 (?)	62·2	56·1	53·8	60
110	110·1	97	(?)	110·5	(?)	116·7	110·5	112·7	124·5	122·3	117·3
94·2	99·3 (?)	105·2	(?)	91·8	(?)	(?)	95·4	(?)	90	96·5	(?)
76·9	68·1 (?)	69·5	(?)	72·35	(?)	72·35	77·6	(?)	70·4	74·5	70·1
48·5	49·3 (?)	48·2	(?)	52·8	(?)	55·3	52 (?)	51·2	50·9	50·9	47
68·5	85·5 (?)	71·6	(?)	81·3	(?)	78·9	85·6	(?)	96·3	95·45	93·2
71	69·6 (?)	74·5	(?)	79·7	(?)	(?)	68·8	(?)	73·1	76·4	(?)
114	111·7	112·15	(?)	110·7	(?)	111·6	108·7	112	110·5	116·7	113·3
44·7	49·3 (?)	45·9	(?)	(?)	(?)	50	48·9	46·8	(?)	(?)	44·3

TABLE III.

Averages.	All the skulls. 29 *adults*, 5 *aged*, 4 *youths.*			
		No.	Range.	
Cubic capacity	1252·1	26	1020	1535
Maximum length	185·1	38	173	202
Ophryo-iniac length	178	37	166	195
Ophryo-occipital length	182	37	173	194
Maximum breadth	131	38	118	142
Bi-asterial breadth	108	34	97	119
Bi-stephanic breadth	103	34	89	118
Bi-auricular breadth	113	34	106	122
Minimum frontal breadth	94	37	79	104
External bi-orbital breadth	107	37	95	120
Bi-zygomatic breadth	128·5	21	108	145
Bi-malar breadth	115·5	30	95	128
Bi-maxillary breadth	92	31	76	103
Jugo-nasal breadth	100	30	86	117
Naso-mental length	111	16	90	121
Ophryo-alveolar length	95	22	76	105
Naso-alveolar length	66·5	28	55	75
Basi-alveolar length	100	27	82	112
Basi-nasal length	99	33	84	110
Basi-bregmatic length	128	33	115	139
Basion to obelion length	124	31	111	134
Basion to lambda length	114	33	100	122
Basi-iniac length	81	33	70	90
Basion to opisthion length	35	33	29	41
Breadth of foramen magnum	30	33	25	33
Orbital height	33	32	29	38
Orbital breadth	43	31	36	45
Nasal height	48	30	39	57
Nasal breadth	26	32	21	32
Palato-maxillary length	58	29	45	68
Palato-maxillary breadth	64	29	55	71
Arcs: Frontal	129	37	114	146
Parietal	128	37	114	145
Occipital superior	65	37	46	84
Occipital inferior	49	35	35	61
Supra-auricular	293	33	272	318
Oblique parietal	345	33	323	380
Jugo-nasal	112	30	95	129
Horizontal circumference	509	38	475	540
Anterior palatine breadth	29	31	27	34
Posterior palatine breadth	40	31	31	49
Minimum inter-orbital breadth ..	25	34	21	30
Occipito-spinal length	193	31	178	210
Occipito alveolar length	200	28	182	220

TABLE III.—*continued.*

Averages.	All the males.			
	24 *adults*, 5 *aged*.			
		No.	Range.	
Cubic capacity	1269·9	20	1020	1535
Maximum length	188	29	175	202
Ophryo-iniac length	183	29	166	195
Ophryo-occipital length	183	29	173	194
Maximum breadth	132	29	118	142
Bi-asterial breadth	109	25	97	119
Bi-stephanic breadth	102	28	89	118
Bi-auricular breadth	115	26	106	122
Minimum frontal breadth	98	29	79	104
External bi-orbital breadth	108	29	97	120
Bi-zygomatic breadth	133	15	123	145
Bi-malar breadth	119	23	109	128
Bi-maxillary breadth	94	24	82	103
Jugo-nasal breadth	102	23	94	117
Naso-mental length	114	12	108	121
Ophryo-alveolar length	98	16	90	105
Naso-alveolar length	68	22	60	75
Basi-alveolar length	103	20	95	112
Basi-nasal length	101	25	93	110
Basi-bregmatic length	130·5	25	122	139
Basion to obelion length	125	23	117	134
Basion to lambda length	115	25	109	122
Basi-iniac length	81	25	70	90
Basion to opisthion length	35	25	30	41
Breadth of foramen magnum	30	25	25	33
Orbital height	33	25	29	38
Orbital breadth	41	24	36	45
Nasal height	49	25	43	57
Nasal breadth	27	25	25	32
Palato-maxillary length	59	22	53	68
Palato-maxillary breadth	65	22	59	71
Arcs: Frontal	130	29	115	146
Parietal	129	29	118	145
Occipital superior	67	29	55	84
Occipital inferior	48	27	35	61
Supra-auricular	307	25	279	310
Oblique parietal	345	26	323	380
Jugo-nasal	113	23	104	129
Horizontal circumference	514	29	475	540
Anterior palatine breadth	30	24	27	34
Posterior palatine breadth	41	24	35	49
Minimum inter-orbital breadth ..	25	27	22	30
Occipito-spinal length	195	24	179	210
Occipito-alveolar length	203	21	182	220

TABLE III.—*continued.*

Averages.	Males, without 4 doubtful ones.			
	21 *adults*, 4 *aged*.			
		No.	Range.	
Cubic capacity	1235	17	1020	1445
Maximum length	188	25	175	202
Ophryo-iniac length	183	25	166	195
Ophryo-occipital length	183	25	173	194
Maximum breadth	131	25	118	140
Bi-asterial breadth	109	21	97	119
Bi-stephanic breadth	101	24	89	118
Bi-auricular breadth	114	22	106	122
Minimum frontal breadth	98	25	79	104
External bi-orbital breadth	108	25	97	120
Bi-zygomatic breadth	131	12	123	141
Bi-malar breadth	118	19	109	128
Bi-maxillary breadth	93	20	82	103
Jugo-nasal breadth	101·5	19	94	117
Naso-mental length	113	9	108	121
Ophryo-alveolar length	98	13	90	105
Naso-alveolar length	67	18	60	73
Basi-alveolar length	103	17	95	112
Basi-nasal length	101	22	93	109
Basi-bregmatic length	130	22	122	139
Basion to obelion length	124	20	117	134
Basion to lambda length	114	22	109	122
Basi-iniac length	82	22	70	90
Basion to opisthion length	35	22	30	41
Breadth of foramen magnum	29	22	25	33
Orbital height	33	21	29	36
Orbital breadth	41	20	36	45
Nasal height	50	21	43	52
Nasal breadth	27	21	25	32
Palato-maxillary length	65·5	18	53	68
Palato-maxillary breadth	65	18	59	71
Arcs: Frontal	131	25	115	146
Parietal	128	25	118	145
Occipital superior	66	25	55	84
Occipital inferior	48	24	35	61
Supra-auricular	307	21	279	310
Oblique parietal	343	22	323	356
Jugo-nasal	113	19	104	129
Horizontal circumference	513	25	475	540
Anterior palatine breadth	30	20	27	34
Posterior palatine breadth	41	20	35	49
Minimum inter-orbital breadth ..	25	23	22	30
Occipito-spinal length	195	20	179	210
Occipito-alveolar length	204	18	191	220

TABLE III.—*continued.*

Averages.	All the females but one.			
	5 *adults.*			
		No.	Range.	
Cubic capacity	1174	2	1138	1210
Maximum length	177	5	175	180
Ophryo-iniac length	173	4	170	175
Ophryo-occipital length	176	4	175	178
Maximum breadth	128	5	124	134
Bi-asterial breadth	104	5	101	107
Bi-stephanic breadth	103	4	97	107
Bi-auricular breadth	109·5	4	106	112
Minimum frontal breadth	94	4	88	99
External bi-orbital breadth	105·5	4	103	106
Bi-zygomatic breadth	121	3	123	125
Bi-malar breadth	115	3	108	118
Bi-maxillary breadth	94	3	90	101
Jugo-nasal breadth	100	3	95	103
Naso-mental length	108·5	2	107	110
Ophryo-alveolar length	89	2	89	89
Naso-alveolar length	67·5	2	65	68
Basi-alveolar length	97	3	92	103
Basi-nasal length	95	4	92	99
Basi-bregmatic length	121	4	115	127
Basion to obelion length	118	4	111	123
Basion to lambda length	107	4	100	110
Basi-iniac length	81	4	72	89
Basion to opisthion length	32	4	29	33
Breadth of foramen magnum	27·5	4	26	29
Orbital height	34	3	31	37
Orbital breadth	39	3	37	41
Nasal height	45	1	45	45
Nasal breadth	26	3	25	28
Palato-maxillary length	56	3	54	57
Palato-maxillary breadth	63	3	63	63
Arcs : Frontal	122·5	4	114	132
Parietal	121·5	4	114	128
Occipital superior	56	4	53	59
Occipital inferior	52·5	4	46	60
Supra-auricular	284	3	272	303
Oblique parietal	344·5	3	344	346
Jugo-nasal	111	3	106	114
Horizontal circumference	491	5	481	500
Anterior palatine breadth	28	3	27	29
Posterior palatine breadth	39	3	38	41
Minimum inter-orbital breadth ..	26	3	24	27
Occipito-spinal length	186	3	178	191
Occipito-alveolar length	197	3	190	200

TABLE IV.

Averages of the Indices.	All the skulls.				All the males.			
	29 *adults*, 5 *aged*, 4 *youths*.				24 *adults*, 5 *aged*.			
Index.		No.	Range.			No.	Range.	
Cephalic	70·5	38	64·9	76·6	70	29	64·9	76·6
Vertical	69·6	35	63·2	77	69·8	26	63·2	76
Alveolar	101·2	29	93·4	108·7	101·8	22	95	108·7
Orbital	82·6	31	70·5	94·9	81·2	24	70·5	92·7
Nasal	55·6	32	47·4	65·1	55·4	26	47·4	65·1
Palato-maxillary	111·7	29	92·2	128·3	110·4	22	92·2	128·3
Facial, total	95·4	14	87·5	105·5	96·2	10	87·5	105·5
Facial, superior (Broca)	73·4	19	66·7	84·7	73·7	13	66·7	84·7
Facial, superior (Kollmann)	51·7	21	47	58·5	51·8	15	47·1	58·5
Stephano-zygomatic	79·9	21	68·5	96 3	76·5	15	68·5	85·2
Gonio-zygomatic	72·9	15	65·35	79 .	72·3	11	65·35	77·9
Naso-malar	111·4	30	107·8	116·7	111·2	23	107·8	114
Dental (Flower)	45·2	13	33·6	50	44·2	10	33·6	49·5

TABLE IV.—*continued.*

Averages of the Indices.	Males without the 4 doubtful ones.				Adult Females (5).			
	21 *adults*, 4 *aged.*							
Index.		No.	Range.			No.	Range.	
Cephalic	69·2	25	64·9	75·1	72·9	5	70·6	76·1
Vertical	69·3	23	63·2	76	68·6	5	65	71·6
Alveolar	102·15	19	95	108·7	102·7	3	97·9	104·3
Orbital	80·5	20	70·5	87·9	87·4	3	77·5	94·6
Nasal	55·9	22	51	65·1	53·25	2	51	55·5
Palato-maxillary	109·6	18	92·2	128·3	112·6	3	110·5	116·7
Facial, total	94·6	7	87·5	105·2	93·6	2	91·8	95·4
Facial, superior (Broca)	73·4	10	66·7	84·7	74·1	3	72·35	77·6
Facial, superior (Kollman)	52·1	11	47·1	58·5	54	2	52·8	55·3
Stephano-zygomatic	75·8	12	68·5	85·2	81·9	3	78·9	85·6
Gonio-zygomatic	71·7	8	65·35	77·9	74·25	2	68·8	79·7
Naso-malar..	111	19	107·8	114	110·4	3	108·7	111·6
Dental Flower)	45·8	8	41·6	49·5	49·45	2	48·9	50

TABLE V.—MEASUREMENTS ON THE LOWER JAW.

	Males.														A	Females.				B	C	D
Number of Skull	*2101*	*2109*	*2105*	*2115*	*2119*	*2122*	*2128*	*2131*	*2133*	*2134*	*2137*	*2138*	*2139*	*2140*	Average	*2110*	*2124*	*2130*	*2132*	Average	Average	Average
Height at symphysis ...	43	32	33	33	22	30	29	33	31	29	29	29	31	32	32	35	26	23	32	33·5	32	31·3
Coronoid height	70	45	67	50	61	58	57	68	73	68	59	65	54	65	61	63	44	46	55	59	59	58·9
Condylar height	63	48	64	49	54	49	52	65	73	63	58	61	54	61	58	61	44	41	52	56·5	56	56
Gonio-symphysial length ...	87	95	82	80	79	78	77	90	83	78	80	77	76	84	82	81	65	61	80	80·5	82	79·6
Intergonial breadth ...	101	102	109	83	97	95	93	99	113	96	93	91	96	105	98	98	79	84	86	92	97	95·35
Intercoronoid breadth ...	105	103	101	87	92	103	92	101	105	101	87	95	100	97	98	95	?	83	94	94·5	97	96·6
Intercondylar breadth, external	123	123	120	115	116	116	114	113	130	117	108	108	118	126	118	115	90	98	111	113	117	114·6
Intercondylar breadth, internal	81	92	78	79	?	78	79	71	85	79	68	69	80	82	78·5	78	62	74	72	75	79	77·1
Breadth of ascending ramus	39	39	36	38	33	32	34	43	38	40	41	35	37	40	38	36	32	31	36	36	38	37
Angle of ascending ramus	128°	123°	113°	133°	126°	132°	124°	127°	116°	114°	110°	107°	126°	102°	120°	112°	118°	127°	119°	115°·5	120°	120°
Basi-mental length ...	?	112	117	118	122	108	110	124	123(?)	106	106	111	117	115	113	116	90	90	103	109·5	113	109·5
Ophryo-mental length ...	160	138	138	138	112(?)	138	135	145	140	135	139	138	139	134	140	134	120	114	131	132·5	140	136·4

Average of all males without No. 2119: A.
Average of 2 adult females: B.
Average of males without Nos. 2119, 2131, 2133, 2134: C.
Average of all of both sexes: D.

TABLE VI.—ADDITIONAL MEASUREMENTS.

Skull.	Weight with jaw.	Weight without jaw.	Length of Parieto-sphenoid suture.		Length of Lacrymo-ethmoid suture.		Choanae or Posterior nares.		Length of floor of nasal cavity.	Least distance between the temporal crests.
			Right.	Left.	Right.	Left.	Height.	Breadth.		
2101	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	66
2102	749	656	10	11	8	8	23	26	57	97
2104	—	669	10	6	9	(?)	22	27	50	93
2105	985	853	10	12	10	9	22	26	59	100
2106	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	100 (?)
2107	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	97 (?)
2108	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	111 (?)
2112	(?)	(?)	1	(?)	(?)	(?)	(?)	(?)	54 (?)	56
2113	(?)	629	—	—	9	9	23	30	56	71
2114	(?)	577	—	2	(?)	(?)	(?)	(?)	(?)	90
2115	893	784	(?)	(?)	7	5	22	27	58	108
2117	(?)	752	6	3	9	6	24	29	54	90
2118	(?)	669	3	11	9	9	28	29	54	75
2119	634	583	—	11	(?)	(?)	25	25	55 (?)	95
2122	639	559	—	—	—	3	24	28	52	95
2123	(?)	580	—	—	10	11	30	29	50	104
2125	(?)	533	13	14	(?)	11	27	32	53	104
2126	(?)	606	5	(?)	7	7	24	27 (?)	46	77
2127	(?)	686	11	(?)	(?)	(?)	27	27	46	89
2128	669	574	(?)	10	(?)	(?)	26	23	55	82
2129	(?)	(?)	3	3	(?)	(?)	(?)	(?)	(?)	94
2131	897	771	15	17	10	(?)	25	26	60	88
2133	800	677	10	12	(?)	14 (?)	(?)	(?)	50	96

TABLE VI.—ADDITIONAL MEASUREMENTS—*continued.*

Skull.	Weight with jaw.	Weight without jaw.	Length of Parieto-sphenoid suture.		Length of Lacrymo-ethmoid suture.		Choanae or Posterior nares.		Length of floor of nasal cavity.	Least distance between the temporal crests.
			Right.	Left.	Right.	Left.	Height.	Breadth.		
2134	634	534	3	3	11	9	26	29	50	116
2136	(?)	(?)	13	5	(?)	(?)	(?)	(?)	(?)	113
2137	917	809	—	—	6	8	23	27	58	73
2138	830	722	2	—	7	6	26	27	54	65
2139	796	707	14	14	9	6	28	26	59	104
2140	816	711	7	8	6	10	22	29	61	77
2103	(?)	(?)	8	8	(?)	(?)	(?)	(?)	(?)	103 (?)
2110	811	705	—	—	7	7	22	27	54	95 (?)
2120	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	104
2121	(?)	532	—	9	2	·5 (?)	26	25	46	95
2132	719	623	5+w	16	6	7	23	24	48 (?)	119
2124	372	327	—	—	7	7	21	24	45	99
2130	(?)	404	14	12	6 (?)	6 (?)	19	29 (?)	44	116
2135	(?)	588	3	8	10	10	20	27	48	113
2111	(?)	586	3	—	(?)	(?)	23	23	49	91 (?)
Average of all..	753·8 (16)	(29) 634·7	7·7 (22)	9·3 (21)	7·9 (20)	7·8 (19)	24·1 (27)	26·9 (25)	52·6 (26)	92·9 32)
Average of males	781·5 (13)	(22) 665·5	8 (17)	8·9 (16)	8·5 (15)	7·8 (15)	25·8 (20)	27·5 (19)	54·1 (20)	89·6 (26)
Average of males without four doubtful cases	782·8 (10)	(18) 673·6	7·3 (13)	8 (12)	8·1 (13)	7·5 (13)	25·8 (17)	27·2 (16)	54·3 (16)	87·5 (22)
Average of females (adults)	765 (2)	(3) 620	6·5 (2)	11 (3)	5 (3)	7 (2)	23·7 (3)	28 (3)	50 (2)	106 (3)

TABLE VII.—DIMENSIONS OF TEETH.

Number of Skull.	Combined lengths of three molar teeth.				Combined lengths of molars and premolars.			
	Upper.		Lower.		Upper.		Lower.	
Males.	Right.	Left.	Right.	Left.	Right.	Left.	Right.	Left.
2101	34	34	39	38	49	49	54	53
2102	32	32	(?)	(?)	46	46	(?)	(?)
2105	31	32	34	35	48	45	50	49
2115	33	32	35	36	51	—	—	—
2117	(?)	32	(?)	(?)	(?)	46	(?)	(?)
2118	29	29	(?)	(?)	42	42	(?)	(?)
2127	(?)	(?)	(?)	(?)	43(?)	(?)	(?)	(?)
2128	31	32	35	33	47	(?)	(?)	(?)
2131	(?)	(?)	(?)	(?)	(?)	(?)	37	(?)
2133	(?)	(?)	(?)	(?)	46(?)	(?)	(?)	(?)
2134	30	(?)	(?)	(?)	44	(?)	(?)	(?)
2137	29	30	31	32	43	44	46	46
2138	32	35	37	37	46	47	52	51
2139	(?)	(?)	35	(?)	44	44	49	49
2140	39	37	40	(?)	50	50	57	(?)
Females.								
2110	(?)	(?)	(?)	32	(?)	(?)	(?)	35
2121	32	31	(?)	(?)	46	46	(?)	(?)
2132	29	30	33	(?)	(?)	(?)	46	(?)
Youths.								
2111	30	31	(?)	(?)	44	43	(?)	(?)
2135	29(?)	(?)	(?)	(?)	42(?)	(?)	(?)	(?)
Average of males.	32 (10)	32·5 (10)	36 (8)	35 (6)	46 (11)	46 (9)	49 (7)	50 (5)
Average of females.	30·5 (2)	30·5 (2)	33 (1)	32 (1)	46 (1)	46 (1)	46 (1)	(?)

	Males.									
Number of Skull.	*2101*	*2102*	*2104*	*2105*	*2106*	*2107*	*2108*	*2112*	*2113*	*21*
Index: Cephalic	64·9	70·2	73·1	70·7	71	68·4	73·3	65·9	68·8	75
„ Vertical	(?)	72·4	70·3	69·1	73·1 (?)	65·3	(?)	74·2	73·5	66
„ Alveolar	(?)	107·8	103·2	105·9	(?)	(?)	(?)	(?)	100	106
„ Orbital	77·8	78·6	86·1	78	(?)	(?)	(?)	(?)	84·6	84
„ Nasal	64	52	53·2	53·1	(?)	(?)	(?)	54·3	51	63
„ Palato-maxillary	102·9	107·7	113	100	(?)	(?)	(?)	(?)	114·5	(
„ Facial (total)	87·5	(?)	(?)	95·7	(?)	(?)	(?)	(?)	(?)	(
„ Facial, superior (Broca).. ..	72·85	(?)	(?)	(?)	(?)	(?)	(?)	(?)	79·5	(
„ Facial, superior (Kollmann) ..	52	(?)	(?)	(?)	(?)	(?)	(?)	(?)	55·3	(
„ Stephano-zygomatic	70·7	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(
„ Gonio-zygomatic	72·1	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(
„ Naso-malar	110·25	113·1	(?)	111·3	(?)	(?)	(?)	(?)	110·9	111
„ Dental (Flower)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(
Cubic capacity	(?)	1155	1080	1368	(?)	(?)	(?)	(?)	1340	12
Maximum length	202	181	175	191	186	193	187	182	189	1
Maximum breadth..	131	127	128	135	132	132	137	120	130	1
Basi-bregmatic height	(?)	131	123	132	136 (?)	126	(?)	135	139	1
Basil-alveolar length	(?)	111	96	107	(?)	(?)	(?)	(?)	106	99
Basi-nasal length	(?)	103	93	101	(?)	101	(?)	99	106	
Orbital height	35	33	31	32	(?)	(?)	(?)	(?)	33	
Orbital breadth	45	42	36	41	(?)	(?)	(?)	(?)	39	
Nasal height	50	50	47	49	(?)	(?)	(?)	46	49	
Nasal breadth	32	26	25	26	(?)	(?)	(?)	25	25	

TABLE VIII.—ABORIGINES OF SOUTH AUSTRALIA.

les.								Females.			Youth.	Average of all.	No.
2113	*2114*	*2115*	*2117*	*2118*	*2122*	*2128*	*2131*	*2103*	*2110*	*2121*	*2111*	—	—
68·8	75·1	67·4	69	67·9	71·8	67	74·7	71·2	70·6	72·3	70·5	70·2	20
73·5	66·5	63·2	73·8	64·8	70·2	66·5	72·1	70·1	70·6	65	64·5	68·9	17
100	106·5	108·7	104	100	96·1	100	100	(?)	104	104·3	101·1	103	14
84·6	84·2	84·6	84·6	85·4	70·5	80	78·6	(?)	90·2	94·6	94·9	83·5	15
51	65·1	51	51	62·5	54·9	50	47·4	(?)	55·5	51	62·2	54·9	16
114·5	(?)	101·5	108·4	112·5	128·3	108·5	120·3	(?)	110·5	116·7	112·7	111·25	14
(?)	(?)	92	(?)	(?)	96·4	97·8	94·5	(?)	91·8	(?)	(?)	93·7	7
79·5	(?)	76·4	(?)	71·3	72·2	72·7	75·2	(?)	72·35	72·35	(?)	73·9	9
55·3	(?)	54·3	52·6	47·1	49·6	50·75	53·3	(?)	52·8	55·3	51·2	52·2	11
(?)	(?)	82·7	(?)	69·9	82	71·2	78·8	(?)	81·3	78·9	(?)	76·9	8
(?)	(?)	65·35	(?)	(?)	71·4	70·45	72·3	(?)	79·7	(?)	(?)	71·9	6
110·9	111·1	111	110·2	109·9	111·5	109·1	110·7	(?)	110·7	111·6	112	110·95	14
(?)	(?)	49·5	46	41·6	(?)	45·6	33·6	(?)	(?)	50	46·8	44·7	7
1340	1275	1190	1300	1225	1348	1135 (?)	1535	(?)	1138	1075 (?)	1165	1260	12
189	185	193	187	193	188	188	190	177	180	177	183	186·35	20
130	139	130	129	131	135	126	142	126	127	128	129	130·7	20
139	123	122	138	125	132	125	137	124 (?)	127	115	118	128	16
106	99 (?)	112	104	101	98	103	110	(?)	103	96	95	103·2	13
106	93	103	100	101	102	103	110	(?)	99	92	94	100	16
33	32	33	33	35	31	32	33	(?)	37	35	37	33·5	15
39	38	39	39	41	44	40	42	(?)	41	37	39	40·2	15
49	43	49	49	48	51	50	57	(?)	45	49	45	48·6	16
25	28	25	25	30	28	25	27	(?)	25	25	28	26·6	16

		Females.			Youth.	Average of all.	No.	Range.	Average of Males.	No.
2128	*2131*	*2103*	*2110*	*2121*	*2111*	—	—		—	—
67	74·7	71·2	70·6	72·3	70·5	70·2	20	64·9 — 75·1	69 95	16
66·5	72·1	70·1	70·6	65	64·5	68·9	17	63·2 — 74·2	69·4	13
100	100	(?)	104	104·3	101·1	103	14	96·1 — 108·7	103	11
80	78·6	(?)	90·2	94·6	94·9	83·5	15	70·59 —94·9	81·1	12
50	47·4	(?)	55·5	51	62·2	54·9	16	47·4 — 65·1	54·6	13
108·5	120·3	(?)	110·5	116·7	112·7	111·25	14	100 — 128·3	110·7	11
97·8	94·5	(?)	91·8	(?)	(?)	93·7	7	87·5 — 97·8	94	6
72·7	75·2	(?)	72·35	72·35	(?)	73·9	9	71·3 — 79·5	74·3	7
50·75	53·3	(?)	52·8	55·3	51·2	52·2	11	47·1 — 55 3	51·9	8
71·2	78·8	(?)	81·3	78·9	(?)	76·9	8	69·9 — 82·7	75·9	6
70·45	72·3	(?)	79·7	(?)	(?)	71·9	6	65·35 — 79·7	70·3	5
109·1	110·7	(?)	110·7	111·6	112	110·95	14	109·1 — 113·1	110·8	11
45·6	33·6	(?)	(?)	50	46·8	44·7	7	33·6 — 50	43·3	5
1135 (?)	1535	(?)	1138	1075 (?)	1165	1260	12	1080 — 1535	1282	10
188	190	177	180	177	183	186·35	20	175 — 202	188·1	16
126	142	126	127	128	129	130·7	20	120 — 142	131·5	16
125	137	124 (?)	127	115	118	128	16	115 — 139	129·9	13
103	110	(?)	103	96	95	103·2	13	95 112	104·8	10
103	110	(?)	99	92	94	100	16	92 110	101·15	13
32	33	(?)	37	35	37	33·5	15	31 37	32·75	12
40	42	(?)	41	37	39	40·2	15	36 45	40·5	12
50	57	(?)	45	49	45	48·6	16	43 57	49	13
25	27	(?)	25	25	28	26·6	16	25 32	26·7	13

No.	Range.	Av. of M. excluding No. *2131*	No.	Range.	Average of Females.	No.	Range.
—		—	—		—	—	
16	64·9 — 75·1	69·6	15	64·9 — 75·1	71·4	3	70·6 — 72·3
13	63·2 — 74·2	69·15	12	63·2 — 74·2	65·2	3	65 — 70·6
11	96·1 — 108·7	103	10	96·1 — 108·7	104	2	104 — 104·3
12	70·5 — 86·1	81·5	11	70·5 — 86·1	92·4	2	90·2 — 94·6
13	47·4 — 65·1	55·2	12	50 — 65·1	53·25	2	51 — 55·5
11	100 — 128·3	109·7	10	100 — 128·3	113·6	2	110·5 — 116·7
6	87·5 — 97·8	93·9	5	87·5 — 97·8	91·8	1	91·8
7	71·3 — 79·5	74·15	6	71·3 — 79·5	72·35	2	72·35 — 72·35
8	47·1 — 55·3	51·7	7	47·1 — 55·3	54·05	2	52·8 — 55·3
6	69·9 — 82·7	73·3	5	69·9 — 82·7	80·1	2	81·3 — 78·9
5	65·35 — 72·3	69·8	4	65·35 — 72·1	79·7	1	79·7
11	109·1 — 113·1	110·8	10	109·1 — 113·1	111·15	2	110·7 — 111·6
5	33·6 — 49·5	45·7	4	41·6 — 49·5	50	1	50
10	1080 — 1535	1264·5	9	1080 — 1368	1138	1	1138
16	175 — 202	186·7	15	175 — 202	178	3	177 — 180
16	120 — 142	130·8	15	120 — 139	127	3	126 — 128
13	122 — 139	129·25	12	122 — 139	121	2	115 — 127
10	96 112	104·2	9	96 112	99·5	2	96 103
13	93 110	100·4	12	93 106	95·5	2	92 99
12	31 35	32·7	11	31 35	36	2	35 37
12	36 45	40·4	11	36 45	39	2	37 41
13	43 57	48·4	12	43 51	47	2	45 49
13	25 32	26·7	12	25 32	25	2	25 25

Part of Table IX.

Seriations of Basi-Bregmatic Height.

Adult well authenticated males from South Australia are considered only.

Cambridge University collection.		All available specimens.	
Modulus 2 units.		**Modulus 2 units.**	
120–122	1	120–122	1
122–124	2	122–124	3
124–126	3	124–126	5
126–128	0	126–128	1
128–130	0	128–130	1
130–132	3	130–132	5
132–134	0	132–134	3
134–136	1	134–136	1
136–138	1	136–138	2
138–140	1	138–140	1
		140–142	1
Modulus 5 units.		**Modulus 5 units.**	
115–120	—	120–125	8
120–125	5	125–130	3
125–130	1	130–135	9
130–135	4	135–140	3
135–140	2	140–145	1

TABLE X.—MEASUREMENTS COMPARED WITH BASI-NASAL LENGTH = 100.

	A.	B.	C.	D.
Cubic capacity	1264·7	1257·4	1222·8	1235·7
Maximum length	187	186·1	186·1	186·3
Ophryo-iniac length	179·8	182·2	182·2	182·1
Ophryo-occipital length ..	183·8	182·2	182·2	185·3
Maximum breadth	132·3	130·7	129·7	134·7
Bi-asterial breadth	109·1	107·9	107·9	109·5
Bi-stephanic breadth	104	101	100	108·5
Bi-auricular breadth	114·1	113·9	112·9	115·3
Minimum frontal breadth ..	94·9	97	97	98·9
External biorbital breadth ..	108·1	106·9	106·9	111·05
Bi-zygomatic breadth	129·8	131·7	129·7	130·5
Bi-malar breadth	116·7	117·8	116·8	121·05
Bi-maxillary breadth	92·9	93·7	92·8	98·9
Jugo-nasal breadth	101	101	100·4	105·3
Naso-mental length	112·1	112·9	111·9	114·2
Ophryo-alveolar length.. ..	95·95	97	97	93·7
Naso-alveolar length	67·2	67·3	66·3	71·05
Basi-alveolar length	101	102	102	102
Basi-nasal length	100	100	100	100
Basi-bregmatic length	129·3	129·3	128·7	127·4
Basion-obelion length	125·25	123·8	122·8	124·2
Basion-lambda length	115·15	113·9	112·9	113·7
Basi-iniac length	81·8	80·2	81·2	85·3
Basion-opisthion length ..	35·35	34·65	34·65	33·7
Breadth of foramen magnum ..	30·3	29·7	28·7	28·9
Orbital height	33·3	32·7	32·7	35·8
Orbital breadth	43·4	40·6	40·6	41·05
Nasal height	48·5	48·5	49·5	47·4
Nasal breadth	26·3	26·7	26·7	27·4
Palato-maxillary length ..	58·6	58·4	64·85	58·9
Palato-maxillary breadth ..	64·6	64·35	64·35	66·3
Arcs: Frontal	130·3	128·7	129·7	128·9
„ Parietal	129·3	127·7	126·7	127·9
„ Occipital superior ..	65·65	66·3	65·3	58·9
„ Occipital inferior ..	49·5	47·5	47·5	55·3
„ Supra-auricular	295·95	304	304	298·9
„ Oblique parietal	348·5	341·6	339·6	362·6
„ Jugo-nasal	113·13	111·9	111·9	116·8
„ Horizontal circumference	514·1	508·9	507·9	517·9
Anterior palatine breadth ..	29·3	29·7	29·7	29·5
Posterior palatine breadth ..	40·4	40·6	40·6	41·05
Minimum inter-orbital breadth.	25·25	24·75	24·75	27·9
Occipito-spinal length	194·9	193·1	193·1	195·8
Occipito-alveolar length ..	202	201	202	207·4
Mandible: Symphysial height..	31·6	31·7	31·7	35·3
„ Coronoid height ..	59·5	60·4	58·4	62·1
„ Condylar height ..	56·6	57·4	55·4	59·5
„ Gonio - symphysial length	80·4	81·2	81·2	84·7
„ Intergonial breadth..	96·3	97	96	96·8
„ Intercoronoid breadth	97·6	97	96	99·5

TABLE X.—MEASUREMENTS COMPARED WITH BASI-NASAL LENGTH = 100.—*continued.*

	A.	B.	C.	D.
Mandible: Intercondylar breadth, external .	115·75	116·8	115·8	118·9
„ Intercondylar breadth, internal	77·9	77·7	78·2	78·9
„ Breadth of ascending ramus	37·4	37·6	37·6	37·9
„ Basi-mental length ..	110·7	111·9	111·9	115·3
„ Ophryo-mental length	137·8	138·6	138·6	139·5
Length of parieto-sphenoid suture	(7·8) (9·4)	(7·9) (8·8)	(7·2) (7·9)	(6·8) (11·1)
Length of lacrymo-ethmoid suture	(8) (7·9)	(8·4) (7·7)	(8) (7·4)	(5·3) (7·4)
Height of posterior nares ..	24·3	25·5	25·5	24·8
Breadth of posterior nares ..	27·2	27·2	27	29·5
Length of floor of nasal cavity.	53·1	53·6	53·6	52·6
Least distance between temporal crests	93·8	88·7	86·6	111·6

Column A. All the skulls.
„ B. All the males.
„ C. Males without four doubtful specimens.
„ D. Females.

TABLE X.(*a*)—COMPARISON OF THE DIMENSIONS REDUCED IN PROPORTION TO BASI-NASAL LENGTH (AVERAGE) = 100.

Series of skulls.	(12) Andamanese.	Fiji: (6).	Torres Sts.	Australians.	
Average value of basi-nasal length	95	104	103·4	101	
Cubic capacity	131	144	137·5	122·2	
Maximum length	176	188	184·3	186·1	
Basi-bregmatic height	136	137	130·9	128·7	
Maximum breadth	142	123	125·7	129·7	
Minimum frontal breadth	97	93	95·1	97	Male skulls only considered.
Bi-auricular breadth	120	112	114·6	112·9	
Horizontal circumference	505	512	498·4	507·9	
Supra-auricular transverse arc	300	289	283	304 (?)	
Frontal arc	127	130	124·6	129·7	
Parietal arc	129	138	126·4	126·7	
Occipital arc	109	118	114·5	112·8	
Length of foramen magnum	35	33	36·7	34·65	
Basi-alveolar length	101	103	106·6	102	
Bi-zygomatic breadth	132	131	130·8	129·7	
Bi-malar breadth	118	115	116	116·8	
Interorbital breadth	25	25	24·2	24·75	
Orbital breadth	38	38	39·2	40·6	
Orbital height	35	32	30 9	32·7	
Nasal height	48	47	46·6	49·5	
Nasal breadth	25	26	24·9	26·7	

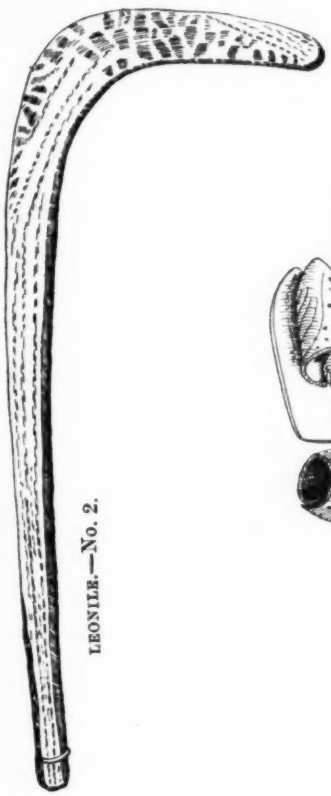
TABLE XI.

TABLE XI.

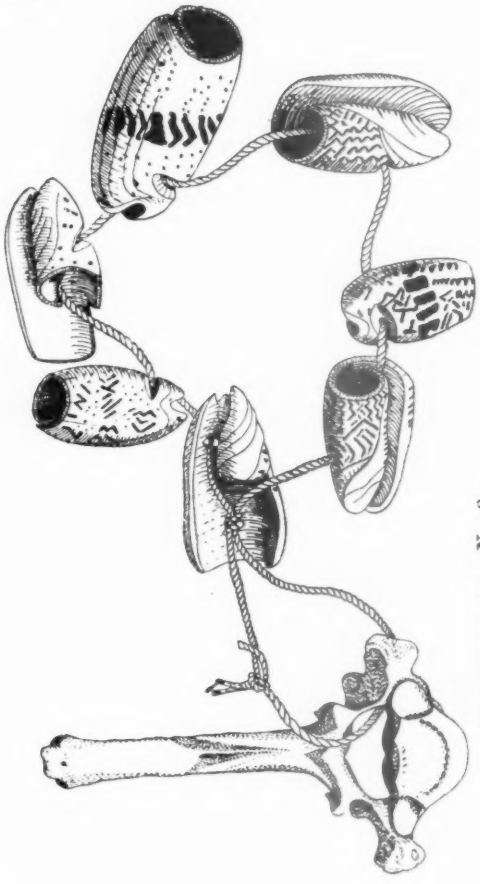
	No. of cases examined.	Occurrence on Right Side.	Occurrence on Left Side.	
Teeth struck out	33	2	1	In all three median upper incisor has been thus lost: the right in natives from New South Wales and Victoria respectively, the left in a South Australian.
Pterion ossides	31	5	4	And in one case only (No. 2137 from N. Territory) on both sides.
Pterygo-spinous ligament.. ..	17	—	—	Indications in seven instances, in nearly all these on both sides.
Anterior lacerate foramen ..	32	—	1	In seven cases nearly closed on both sides, in one on left side only.
Sphenoid contribution to glenoid fossa	32	2	1	The spine is prolonged thus in twenty-one cases on both sides, in two on right, in one on left only.
Post-condylar foramina	30	5	1	Are pervious in seven cases on both sides, in five on the right, in one on the left only.
Mastoid foramina	30	4	3	Occur ten times on both sides, four on the right and three on the left only.
Vesalian foramina.	33	4	7	Occur in twelve cases on both sides, in four on the right, in seven on the left only.
Styloid processes	17	—	—	In ten cases rudimentary, of considerable length in seven cases.
Para-mastoid processes	31	1	1	Very large in one case (male No. 2105).
Tuber maxillare	31	—	—	In eight cases is large, in two is insignificant.
Third occ. condyle..	33	—	—	Traces in five cases, especially distinct in No. 2137.
Ext. pterygoid fossae	27	—	—	Are deep in eleven cases, shallow in thirteen.
Ext. pterygoid plates	29	—	—	Project strongly in seventeen, moderately in nine, nearly vertical in three.
Infra-temporal crest	35	—	—	Distinct in twenty-nine cases, usually spiny, sometimes tuberous.
Post. palatine spine	28	—	—	In seventeen cases rounded, in six obtuse, in four acute, undeveloped in one.
Hamulus lacrymalis	22	9	8	Present in six cases on both sides.
Axes of orbits	34	—	—	Horizontal in eighteen, droop slightly externally in sixteen cases.
Infra-orbital suture	30	12	11	Present on both sides in eleven cases, in two on right only, traces in five other cases.
Fronto. max. suture	24	1	—	One case only.
Div. of malar	30	3	4	On both sides in three cases, on one side (the left) in one case only.
Div. of occipital	37	9	9	In nine cases, and in all on both sides.
Squamo-mastoid angle	38	—	—	Obtuse in thirty cases (in three reaches 180°), acute in six cases (nearly 90° in one), one synostosed.
Parietal foramina..	36	15	14	On right alone, eleven; on left alone, ten; on both sides, four; on neither side, eleven.
Spheno-maxillary suture outside orbit	29	11	10	In ten cases on both sides, in one case on right only, absent from seventeen cases.

TABLE XII.—AVERAGES OF INDICES FROM ALL AVAILABLE DATA.

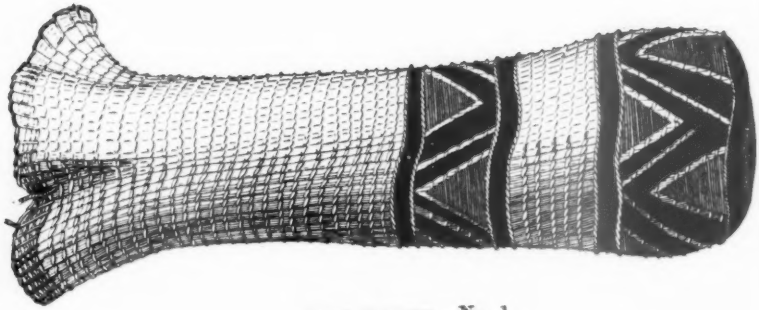
Measurement of Index.	All skulls.	No.	Male skulls.	No.	Female skulls.	No.
Cubic capacity	1246·5	150	1297	97	1148·5	49·
Cephalic index	70·95	214	70·25	111	72·4	53·
Vertical index	71·5	171	71	108	71·4 (?)	52·
Alveolar index	101·1	114	100·4	73	103·1	33
Nasal index	55·1	169	55·75	77	54·9	26
Orbital index	81·3	175	80·2	101	84·9	46
Stephano-zygomatic index	82·05	133	79·8	95	85·6	35
Palato-maxillary index	110·1	63	112	44	110·3	14·
Total facial index	99·4	21	96·2	10	93·6	2
Superior facial index (Broca)	68·9	74	68·5	31	68·2	10·
Superior facial index (Kollmann)	49·9	54	49·9	36	49·8	11·
Gonio-zygomatic index	71·9	40	71·6	25	70·1	7·
Dental index (Flower)	45·3	49	45·1	30	46·5	16·



LEONILE.—No. 2.



MUSICAL INSTRUMENT.—No. 3.



RUSH BASKET.—No. 1.

On an unusual form of RUSH BASKET *from the* NORTHERN TERRITORY *of* SOUTH AUSTRALIA. By R. ETHERIDGE, Jun.

[WITH PLATE XVII.]

A VERY interesting and unusual type of rush basket has lately come under my notice, from the Northern Territory of South Australia. For an opportunity of describing this abnormal shape amongst Australian baskets, I am indebted to the kindness of Mr. Harry Stockdale, of Sydney, the Northern Territory explorer and hunter. It was obtained from the Alligator Rivers Tribe, a people inhabiting the country watered by the three rivers of that name flowing into the south-east corner of Van Diemen's Gulf (lat. 12° 0′ S., long. 132° 0′ E.). The basket is peculiar by reason of its crumpled, bell-shaped mouth and ornate colouring.

With few exceptions the neat-made baskets of the Australian aborigines are wide, open-mouthed receptacles, and are either circular and truncated, flat-bottomed and straight-sided, or even slightly tapering, when they are known in the south as *Kal-later*[1]; or flat and circular, with a contracted mouth on the side, called in South Australia, *Pol-la-da-noo-ko*;[2] or, of the North Queensland type, large, wide, bulging, open-mouthed, and more or less flexible, with curved semi-cuneate bases.[3]

In the present instance the basket is cylindrical, narrow, and practically flat-bottomed, sufficiently so to enable it to stand alone, decreasing in size upwards to a comparatively narrow neck, and then expanding to a somewhat crumpled, bell-shaped mouth, with one diameter greater than the other. The width at the bottom, which is slightly inflated, is $3\frac{1}{2}$ inches; at the neck, $2\frac{3}{4}$ inches; and across the expanded mouth, 5 inches; the height is $11\frac{1}{2}$ inches. The proportions and colouring, although simple and conventional, by no means display a lack of taste on the part of the aboriginal maker. The material of which the basket is made is evidently a small rush, or coarse grass, and its structure consists of a series of "stakes," close and parallel, intertwined alternately over and under by thinner "siding" of the same material. The "stakes" have an average width of rather more than one-sixteenth of an inch, whilst that of the "siding" is less. The "stakes" are practically close together, but as the bottom is receded from, an almost imperceptible widening out takes place, so as to form the expanded mouth, but the spacing of the "siding" is remarkably regular and well kept. The edge

[1] Eyre, "Journ. Exped. Discovery into Central Australia," 1845, ii, p. 512.
[2] *Ibid.*, 1845, ii, p. 512.
[3] Lumholtz, "Amongst Cannibals," 1890, pp. 190, 195, and 276.

of the mouth is guarded by a margin of bistrand string, made of beaten and twisted fibre, and this is also whipped over and over the immediate periphery of the basket to a depth of three-eighths of an inch. Immediately below this, by bringing the three uppermost sidings together, a series of holes is left, thus giving a better definition, or finish to the mouth-edge, and forming an open sub-marginal band. (No. 1.)

The colouring is remarkably well effected. In the first place there are four concentric narrow black bands, from two to three-eighths of an inch wide, gradually becoming further apart from the base upwards, and defended at each edge, top and bottom, by a raised rim of interlaced native string. These black bands separate the surface of the basket into three rather unequal zones. The uppermost of the black bands is six inches from the mouth margin, and the whole of this space is plastered with white pipe-clay. The lowest black band forms the periphery of the flat bottom of the basket. The latter and the second zone are also coated with white pipe-clay; but the first and third, or bottom, zone are divided into triangular spaces, by black and white lines. The bottom zone contains eight of these triangular spaces, and the top zone six. Each triangle is first margined by a narrow white pipe-clay line, then a broader black line, or almost band, again followed by another white line. The triangles have their apices alternately directed upwards and downwards, and are not all of equal size. They are coloured a deep Indian red, and present a slightly sparkling appearance, from the presence of mica scales in the clay from which the pigment has been prepared. It is quite evident that both the top and bottom zones containing these triangular spaces were first wholly coloured Indian red, and then the black and white lines painted over the latter pigment. The basket is remarkably light, weighing only $2\frac{1}{2}$ ounces. With regard to its special use, I am unable to afford any definite information, but both its construction and lightness would appear to indicate that it could not have been put to any great degree of rough usage.

The Alligator Rivers Tribe, from which this basket emanates, appear to have been great adepts in the manufacture and colouring of these weapons and utensils. I have lately had the pleasure of examining a large series of these, and they all bear out this view.[1]

I am indebted to my colleague, Mr. Charles Hedley, F.L.S., for the accompanying excellent drawing of the basket.

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[1] See the forthcoming "Macleay Memorial Volume" of the Linnean Society of New South Wales.

On a Modification of the AUSTRALIAN ABORIGINAL WEAPON, *termed the* LEONILE, LANGEEL, BENDI, *or* BUCCAN, *&c.* By R. ETHERIDGE, Jun.

I AM indebted to Mr. W. H. Hargraves, Deputy Master-in-Equity, Sydney, for an opportunity of noticing an interesting modification of the Australian weapon known as the *Leonile* or *Langeel*. It is one of the lesser known weapons, but appears to have been used by the aborigines of Victoria, New South Wales, and Queensland. The *Leonile* consists, speaking generally, of a more or less long straight handle, or shaft, and a sharp pointed head, of greater or less length, either at right angles to the former, or opposed to the shaft at an angle somewhat greater than a right angle. It is used in single combat, and is one of the most deadly weapons amongst the aborigines themselves, "because of the facility with which the point can be suddenly turned at the moment of striking."[1] The combatants are protected, when in combat with this weapon, by the small, flat-faced and angular-backed shield, formerly termed by the Victorian blacks, the *Mulga*.

Considerable variation seems to exist in the relative length of head to shaft, and the width at that point where shaft and head may be said to meet. In the Victorian weapon, figured[2] by the late R. B. Smyth, the enlargement is, in proportion, greater than in our specimen, the head of moderate length, tolerably thick, and fined off to an obtuse rather than an acute point. Smyth's figure gives one the idea of a roughly finished weapon, except at the immediate handle, or hand-grasp, where it is elaborately carved, with vertical lines filled in transversely with herring-bone sculpture and figures on the shaft above. On the shaft is a rhomb with dots, and two indistinct figures, but rather resembling insects.

The modifications figured by the late Governor G. J. Eyre are very marked. One[3] exhibits the short and acutely pointed head absolutely at right angles to the shaft; a second[4] is much enlarged and thickened at the distal end of the handle, with a short head forming almost an acute angle with the former. In the third modification,[5] the union of the head and handle forms a more obtuse angle, and approaches nearer to Smyth's figure,

[1] "Aborigines of Victoria," 1878, i, p. 302.
[2] *Ibid.*, f. 62.
[3] "Journ. Exped. Discovery into Central Australia," 1840–41 (2 vols., London, 1845). Vol. II, Pl. III, f. 13.
[4] *Ibid.*, Pl. III, f. 12.
[5] *Ibid.*, Pl. III, f. 11.

except that the head is bluntly pointed. The fourth[1] and last of Eyre's figures represents a very extraordinary weapon, more like an openly-curved sickle, set on a long, slightly bent handle, than anything else it can be compared with. It retains the same width throughout, no apparent difference between head and shaft being noticeable, but terminating distally in a very sharp point. Three out of the four are sharpened at the proximal end, and all are transversely carved to afford a firm hold for the combatant.

Lieut. Breton, R.N., many years ago figured[2] "a formidable weapon, used at Port Macquarie;[3] its length is 3 feet, and the arm (if it may be so termed) about 18 inches more." The *Leonile* in this case, for no other weapon can be intended by the author, consists of a cylindrical handle, gradually enlarging upwards to its union with the head, which is absolutely at right angles to the former, and thence tapering in an inverse ratio to the distal point of the weapon. Allowing for a certain amount of conventionality in the figure, I cannot do better than compare Breton's figure of the *Leonile* to a mason's or carpenter's square.

The present weapon, represented in the accompanying figure (No. 2) has a total length of about 2 feet 5 inches. The shaft is hardly straight in any part, but is comparatively so for about 1 foot 9 inches, thence gently curved round into the head, which is for all practical purposes at right-angles, with an obtuse distal end. As compared with other modifications of this weapon, the head is short. The only attempt at ornamentation consists of a transverse ridge, close to the proximal end, probably to give a firmer grasp to the hand of the holder. The weapon is an exceedingly well finished one, made from a handsome variegated wood, which may possibly be that of the "Beantree" (*Castanospermum australe*), a leguminous wood not unlike walnut. It weighs 1 lb. The width of the shaft at the point held by the hand is $1\frac{1}{2}$ inches; at its widest point $2\frac{1}{2}$ inches; whilst the length of the head is 6 inches.

Compared with the published figures of the *Leonile*, our weapon is unquestionably of a much more finished type. It is not precisely like either of the four illustrations given by Eyre, and, as compared with that of Smyth, lacks the carving of the handle, gradate nature of the immediate proximal end, and the figures on the shaft. Judging, however, by the shading of the latter, the present weapon appears to be a much more finished one, in

[1] *Ibid.*, Pl. III, f. 10.

[2] "Excursions in New South Wales," &c., 1830–33 (8vo., London, 1833), p. 238.

[3] "Aborigines of Victoria," 1878, f. 62.

so far as the actual shape, make, and surface fining-down are concerned.

The name *Leonile* or *Langeel* is applied to this weapon in Victoria proper, but in South Gippsland, about Lake Tyers, the late R. B. Smyth believed it was known as *Darn-de-wan.* We have Lieut. Breton's statement that it was known at Lake Port Macquarie, New South Wales, although he does not supply a local name for it. I am informed by Mr. Robert Grant, Zoological Collector to the Australian Museum, Sydney, that the *Leonile* is known in the Bellinger, Clarence, Tweed, and Nambuckra Rivers Districts as *Coupon*, and, in all probability, that now under description comes from hereabout, as the exact locality is unknown. Carl Lumholtz figures a short-headed, long-handled *Leonile*, closely resembling a single-headed miner's pick, from the Herbert River District, Central Queensland, where it is known as *Bendi.*[1] It is made from the wood of the *Eucalyptus excurata.* The weapon is also known in the Moreton and Wide Bay Districts, Queensland, where Mr. Archibald Meston, of Brisbane, informs me it is called *Buccan.*

The following table shows the local names and distribution at a glance.

Locality.	Name.	Authority.
Victoria generally	*Leonile* or *Langeel.*	R. B. Smyth.
South Gippsland	*Darn-de-wan.*	"
Port Macquarie, N.S.W.	——	Breton.
Bellinger, Clarence, and Tweed River Districts, N.S.W. ..	*Coupon.*	R. Grant.
Moreton and Wide Bay Districts, Ql.	*Buccan.*	A. Meston.
Herbert River District, Ql.	*Bendi.*	C. Lumholtz.

Mr. R. Grant says that in the district where he has observed this weapon (Bellinger, &c.), advantage is taken by the blacks of any large protruding excrescence from the trunk, and the *Coupon*, as they call it, is then cut out of it cross-wise. I also think little doubt can be entertained that, from the appearance of Eyre's illustrations, roots have been taken advantage of to fashion this remarkable weapon.

Some diversity of opinion seems to exist as to the method of using the *Leonile*, whether the point or the round is used in striking. As a matter of fact, both appear to be employed. Lieut. Breton[2] tells us that the object of its peculiar shape is

[1] "Amongst Cannibals," 1890, p. 332.
[2] *Loc. cit.*

"that the warrior may be enabled to strike round the shield, or eleman, of his adversary." Mr. G. F. Lang[1] relates a case where an intended husband, when beating an eloped girl, "finished by driving the point of his liangle into the crown of her head." The object of striking over the guard, afforded by the shield, with the point, has been confirmed by Messrs. Meston and Grant, both of whom have seen the *Leonile* used. Mr. Grant further states that when a combatant wishes to strike side-wise and from himself with a back-handed blow, the round, and not the point, of the *Leonile*, is used. Perhaps, after all, the most peculiar mode of using it is that related by Lumholtz, who says that about the Herbert River, fighters "try to hit the kidneys of their opponents," that being the most vulnerable point to the aborigine mind.

As in the case of the basket, I am indebted to Mr. Charles Hedley, F.L.S., for the accompanying drawing.

An AUSTRALIAN ABORIGINAL MUSICAL INSTRUMENT. By R. ETHERIDGE, Jun.

THE recorded instances of the use of Musical Instruments amongst our aborigines are, comparatively speaking, so few, that the description of an authenticated instrument will probably prove welcome. For an opportunity of describing the present example of what may, for the want of a better name, be termed a rattle, or perhaps even "castanets," I am indebted to the well known Australian traveller and explorer, Mr. Harry Stockdale. The instrument was obtained 100 miles inland from Port Douglas, near Cairns, on the north-east coast of Queensland. Before proceeding to describe this interesting object, I may perhaps, be allowed to refer to what is generally known of the use of instruments of music amongst the Australian aborigines, or, at any rate, their rough and ready make-shifts for the more finished appliances of cultured peoples. During the widely spread dance generally known as the *Corroboree*, or, more particularly in Victoria as *Ngargee, or Yain-yang*, the women of the tribe, who take the part of musicians, are seated in a semi-circle, a short distance from the large fire lit on these occasions holding on their knees opossum rugs tightly rolled and stretched

[1] "Aborigines of Australia," 1865, p. 11.

out. These are struck by the right hand, in time with the action of the master of the ceremonies, usually one of the old men. He carries in each hand a corroboree stick, and these are struck together, accompanied by a nasal drone. Many of the dancers are similarly provided.[1] This use of the opossum cloak and clanking of the sticks appears to be the most primitive form of musical instrument, if it can be so termed, amongst our aborigines. The eminent surveyor and explorer, the late Sir F. L. Mitchell, in describing[2] their "universal and highly original dance," refers to the rolled up skins in the following words—"and thus may be said to use the tympanum in its rudest form." On the Maranoa River in Queensland, a modification of this opossum-cloak drum is in use, by rolling up earth inside the skins, and then striking with a stick.[3]

The Rev. G. Taplin states that amongst the Narrinyeri, a tribe inhabiting the country about the Lower Murray River, and the Lakes Alexandrina and Albert in South Australia, the rolled up skin drums are called *planggi*, and the act of drumming, *plangkumbalin*. The corroboree sticks are *tartengk*, and the act of striking them together is termed *tartembarrin*. The dance is known to this tribe as *ringbalin*.[4]

On the other hand, amongst those of the Northern Queensland tribes who use boomerangs, the latter are employed in the dance in place of one of the sticks, or to beat time.[5]

In Western Victoria, amongst the local tribes, the rolled up rugs sometimes contain shells, so as to produce a jingling sound. According to Mr. J. Dawson,[6] who mentions this fact, the "music stick" is made of hard wood, 9 inches long, by 1½ inches in diameter. It is rounded, and tapers at each end to a point. One stick is held fast and struck by the other, producing a clear and musical sound. A still further modification exists on the Herbert River, in Central Queensland, where the female musicians beat "both their open hands against their laps (or, more probably, their buttocks) thus producing a loud hollow sound."[7]

The Brothers Tardine, during their memorable journey, in 1867, from Port Denison to Cape York, saw two drums in use near Newcastle Bay, obtained by barter from the Torres Straits

[1] Smyth, "Aborigines of Victoria," 1878, i, p. 167.
[2] "Three Expeditions into the Interior of East Australia," 1838, ii, p. 5.
[3] G. S. Lang, "Aborigines of Australia," 1865, p. 28.
[4] Wood's "Native Tribes of South Australia," 1879, No. 1. "The Narrinyeri," by Rev. G. Taplin, p. 37.
[5] Palmer, "Journ. Anthrop. Inst. Gt. Brit. and Ireland," 1884, xiii, p. 287.
[6] "Aborigines of Australia," 1881, p. 80.
[7] Lumholtz, "Amongst Cannibals," 1890, p. 236.

Islanders, and clearly of a Papuan type. These were neatly made of a solid piece of wood scooped out, in shape like an elongated dice-box. One end was covered with the skin of a snake or iguana, and the other left open. Such drums were termed *waropa* or *burra burra*.[1]

The use of drums also extends to Western Australia, for Ogle observes that a "kind of drum, made of kangaroo skin stretched over a bundle, and beaten with the fists," is employed.[2]

Advancing a step further, to instruments of a more truly musical nature, we find that Capt. J. Lort Stokes, R.N., saw in use at Port Essington, during a corroboree, a bamboo trumpet. It consisted of a piece of bamboo, thinned from the inside, through which the performer blew with the nose, producing a kind of droning noise. This pipe was from 2 to 3 feet long, and was called *ebroo*.[3] It is evidently the same instrument as that spoken of by Dr. Coppinger,[4] who saw at a camp of the Larikia Tribe, in the vicinity of Port Darwin, pieces of "hollow reed," about 4 feet long, that were blown "like cow-horns," and produced a "rude burlesque of music." In the forthcoming "Macleay Memorial Volume" of the Linnean Society of New South Wales, I have described similar trumpets in detail, used by the Alligator Rivers Tribe at Van Diemen's Gulf, North Australia.

The rattle now under description consists of seven shells strung on string, and suspended from a vertebra. The shells are two species of olive, *Oliva episcopalis*, Lamk, and *O. elegans* Lamk. The apices have been completely ground off, leaving only two body whorls, and these have been transversely cut through. The string, which is two-ply, and made of fibre, dyed brown, is passed through the hollow body whorls of the shells and out through each slit on the backs. The two parts are brought together and knotted, so as to form a loop. One of the free ends is then put through the neural canal of the vertebra, and tied. In two of the shells the string passes directly through the slits, and not vertically down the body whorl at all. The vertebra is one of the anterior dorsal of a dog. The jingle caused by shaking the shells is pleasant and melodious, the vertebra being held in the hand.

The genuineness of this rattle as an Australian instrument, in the first instance, is, of course, not absolutely assured, for the type seems to me to have a decidedly Papuan appearance. Whether

[1] *Vide* Smyth, "Aborigines of Victoria," 1878, i, p. 174.
[2] "Colony of Western Australia," 1839, p. 61.
[3] "Discoveries in Australia," 1837–43, i, 1846, p. 394.
[4] "Voy. 'Alert,'" 1883, p. 204.

it was simply adapted from a Papuan pattern, or directly obtained by means of barter, is, of course, open to conjecture. At any rate, it was found in the hands of blacks, 100 miles inland from Port Douglas, situated to the north of the town of Cairns, on the north-east coast of Queensland. (No. 3.)

Count D'Albertis figures[1] a few New Guinea musical instruments, amongst them what seems to be a cluster of shells, nuts, or some other small and like objects attached to the end of a flexible handle, and used, I should imagine, as a rattle. Similarly Prof. A. C. Haddon describes[2] the musical instruments in use by the Western Tribe of Torres Straits Islanders as consisting of drums, a primitive kind of rattle, and two sticks that are beaten together. He also adds that "empty seeds (*goa*) or shells are often attached to masks or drums to serve as rattles. When dancing, the rattle seeds may also be attached to a stick held in the hand, or slung on a belt and hung in a bunch behind, or rattles may be tied on to the arms or ankles."

These quotations show, I think, the derivation of our shell rattle from the Papuan idea, and indicate, in conjunction with a number of other facts which could be brought forward, the close relation that has existed at times between our aborigines and the Papuans by means of their intermediaries, the Torres Strait Islanders.

The extensive system of barter carried on over the whole continent of Australia, may almost be described as a natural characteristic of the aboriginal Australian. The great distances that articles of utility as well as what may be called nick-nacks travel, passing from tribe to tribe, is remarkable, and according to Mr. A. W. Howitt[3] is "spread all over the interior of the continent." In nothing is this more prominently shown than the occurrence inland of marine shells. Hodgson[4] saw mother-o'-pearl in the Condamine country that must have travelled as much as 100 miles inland. Leichhardt relates several instances: thus at Ant Hill Creek, in the Mount Lang District, Queensland, the local tribe journeyed to the sea coast in quest of shells, particularly the pearly nautilus, "of which they make various ornaments"[5]; this party found a *Cymbium* in the dillybags of the Lynd River natives,[4] a subsidiary stream flowing into the Mitchell River in Cape York Peninsula; and at the camping place[6] of the Albert River men a *Cytherea* and a *Dolium* were

[1] "New Guinea," 1880, i, pl. opp. p. 305, f. 20 and 31.
[2] "Journ. Anthrop. Inst. Gt. Brit. and Ireland," 1890, xix, p. 374.
[3] "Journ. Anthrop. Inst. Gt. Brit. and Ireland," xx, p. 76, *note*.
[4] "Reminiscences of Australia," 1846, p. 248.
[5] "Overland Expedition, Moreton Bay to Port Essington," 1848, p. 257.
[6] *Ibid.*, p. 279.

observed.[1] Even as far inland as the Dieri Tribe, who inhabit the country about Coopers Creek, East Central Australia, the single valve of a large marine shell was seen by Howitt.[2]

For the excellent drawing accompanying this paper I am indebted to Mr. Charles Hedley, F.L.S.

The ABORIGINES *of* NORTH-WEST AUSTRALIA.

By P. W. BASSETT-SMITH, Surgeon R.N.

[WITH PLATES XVIII AND XIX.]

FOR rather over three months after joining H.M.S. "Penguin," a surveying ship employed on the Australian station in 1891, it was my good fortune to see many of the aboriginal natives of that country, who, in the north-west part, are and have been less in contact with civilized or western man than in any other portion.

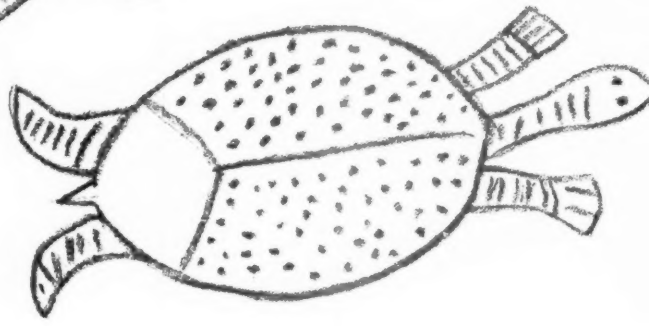
The personal observations of the natives themselves were obtained near Port Darwin, and particularly from a camp on the Adelaide River, 80 miles from that place, where there is a station on that part of the northern commencement of the trans-continental railway which as yet only reaches the gold fields, some 160 miles up; here the only Europeans were the stationmaster and his wife, with a single police trooper; also from Roebuck Bay on the West coast, lat. 18·0° S., at the so-called town of Broome, there being only the telegraph establishment with six Europeans, one wretched hotel for use of the "pearlers," a post office, and an agent of Streeter's with a few Japanese, so that here the influence of outsiders cannot be very great on the natives.

Observations of their camps, &c., were also made on a few of the islands, and once on the mainland, but on these occasions I never saw any natives, though there is good reason to believe that they were sometimes very close by. Before I joined the ship, however, boating parties had been attacked by small troops of natives coming out with a rush, and throwing spears, sticks, paddles, &c., so that great care had always to be taken, and they were frequently sighted by officers at different times.

A short description of the climate and general character of the country is necessary to enable us to understand the natural conditions under which the people live.

[1] *Op. cit.*, pp. 348, 356, and 359.
[2] *Op. cit.*, p. 76, *note*.

DRAWINGS IN CAV
PARRY ISLAND, ADMIRA



Harrison & Sons Lith. St Martins

S IN CAVES.
, ADMIRALTY GULF.

P.W.B.S.

s Lith. S. Martins Lane, W.C.

Situated between 11 and 18 degrees of south latitude, the intensity of the sun's rays is very great, this with a very long dry season, sometimes nine months without rain, produces a heat of the ground very excessive, that is during the South-East trade, which blows right across the continent, and is absolutely dry, so that almost all the water holes, and all the lowlands become dried up during this season, to become extensive swamps again after the heavy rains of December and January. The heat in October up the Adelaide River, at an elevation of some 400 feet above the sea, as I know to my cost, very readily produces fever, and except in the early morning, and in the evening it was impossible to do any work, or collecting out of doors, the wind having a scorching heat as if from the blast of a furnace, and the glare from the dry dusty earth being blinding; unfortunately I had no thermometer to take accurate observations. These conditions naturally prove fatal to any but the most hardy animals and plants, and that with these poverty-stricken surroundings, the inhabitants are miserable and repulsive is not surprising.

The northern part near Port Darwin geologically had a foundation of felsites and micaceous schists; on these about 4 feet of soft yellow ochreish clay, next about 30 feet of white rock unaffected by acids and containing much iron, probably a ferro-silicate of magnesia, topped by a ferruginous sandstone, and conglomerate; at the Adelaide River the felsites outcrop at the tops of the hills. Round Admiralty Gulf and Roebuck Bay the mainland is very flat, and the islands low and table like; here the felsites again are found, but the white rock has disappeared, and they are covered by beds of fine quartzite, and coarse ironstone conglomerate. The ochres are used by the natives extensively for staining their bodies and weapons, the silicate rock is eaten for its purgative properties, and the schists and quartzites are used for making spear heads, &c. The whole country except close to the rivers being covered by a thin shadeless bush of eucalyptus, and acacia trees, with a few cycads, and coarse tall grass underneath.

Throughout the whole region the natives were very thinly scattered, and are divided into a large number of different tribes, each being again split up into a number of camps, the members of the latter always keeping together, and having a headman, who in the chief camp of the tribe is called "king," and has a considerable amount of authority, having many wives and power of giving women away to be wives of others. As the weapons of these tribes differ considerably it will be well to take them more in detail.

There was one camp near the station on the Adelaide River

of the Woolwonga tribe consisting of about thirty men, women, and children; it was not always in the same spot, though generally on the banks of the river in a small clearing; their means of shelter were nil (at both my visits, July and October), but at night time they would light a number of small fires, and around each would crouch, six or seven of both sexes, together with children with absolutely no clothing on; there was no hut of any description, and even in the wet season they only put up a few branches for protection.

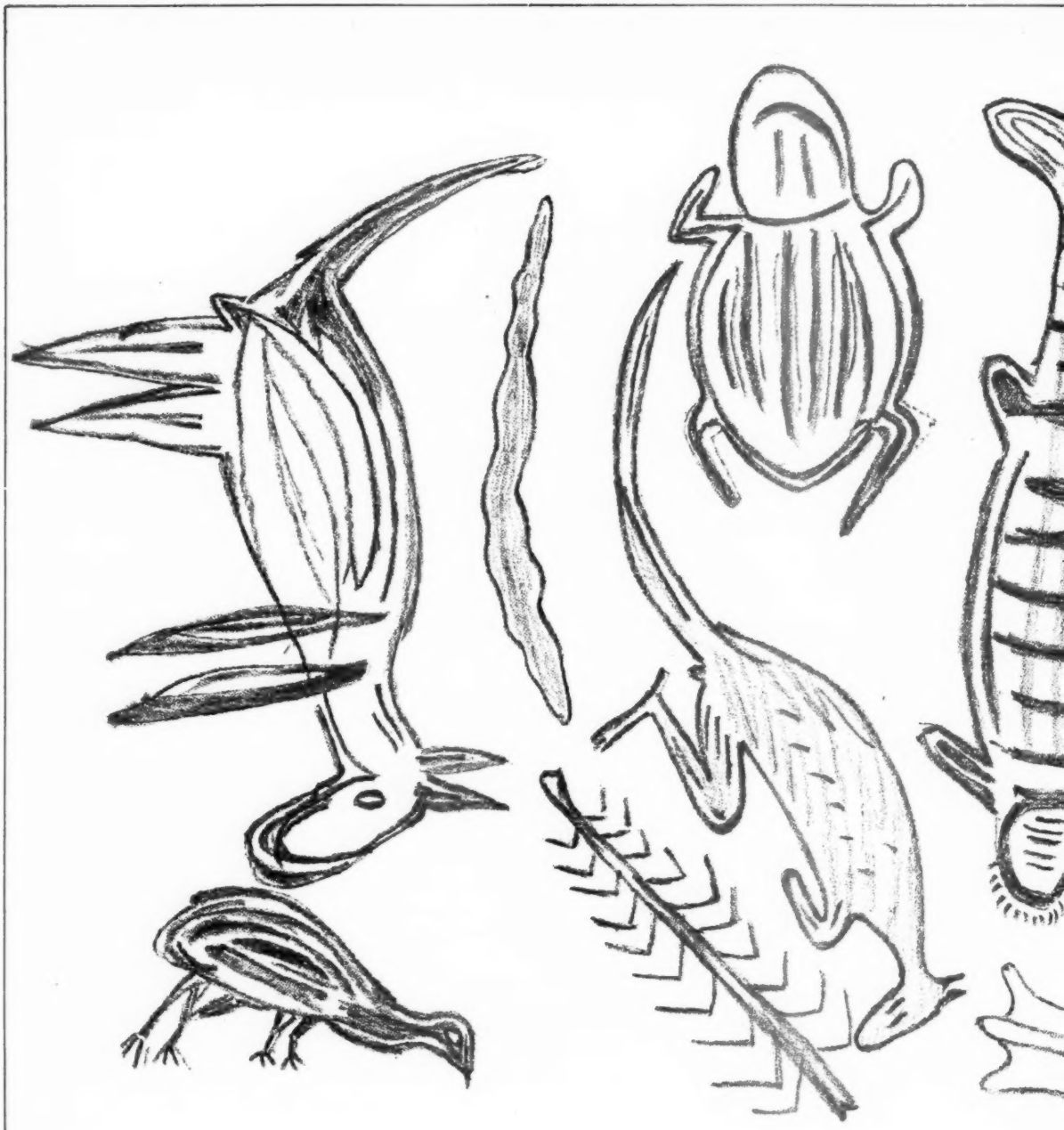
I obtained the following measurements from them:—

	No. 1 Man.	No. 2 Man.	No. 3 Woman.	No. 4 Boy about 15.
Height	5 ft. 9½ in.	5 ft. 5 in.	5 ft. 3½ in.	5 ft. 1½ in.
Chest circumference ..	32½ in.	33¼ in.	30½ in.	26 in.
Head, length	7 1/16 „	7 8/16 „	7 4/16 „	6 12/16 „
„ width	6 „	6 „	5 8/16 „	5 4/16 „
„ index	77	80	75	80
„ circumference ..	22 12/16 in.	22 in.	21 in.	20½ in.
Length of face ..	8 „	8 „	7½ „	7½ „
Upper extremity ..	30½ „	28½ „	28 „	26½ „
Lower „ from A.S. spine of ilium	38½ „	36 „	36 „	35½ „
Wrist circumference ..	5½ „	6 „	5½ „	6 „
Ankle „ ..	7 „	7½ „	7 „	7½ „
Hair „ ..	Curly.	Strong lank.	Breasts, pendant.	—
Beard „ ..	Strong wiry.	Slight.	—	—

N.B.—The width of the heads is too great owing to the thickness of the hair on either side.

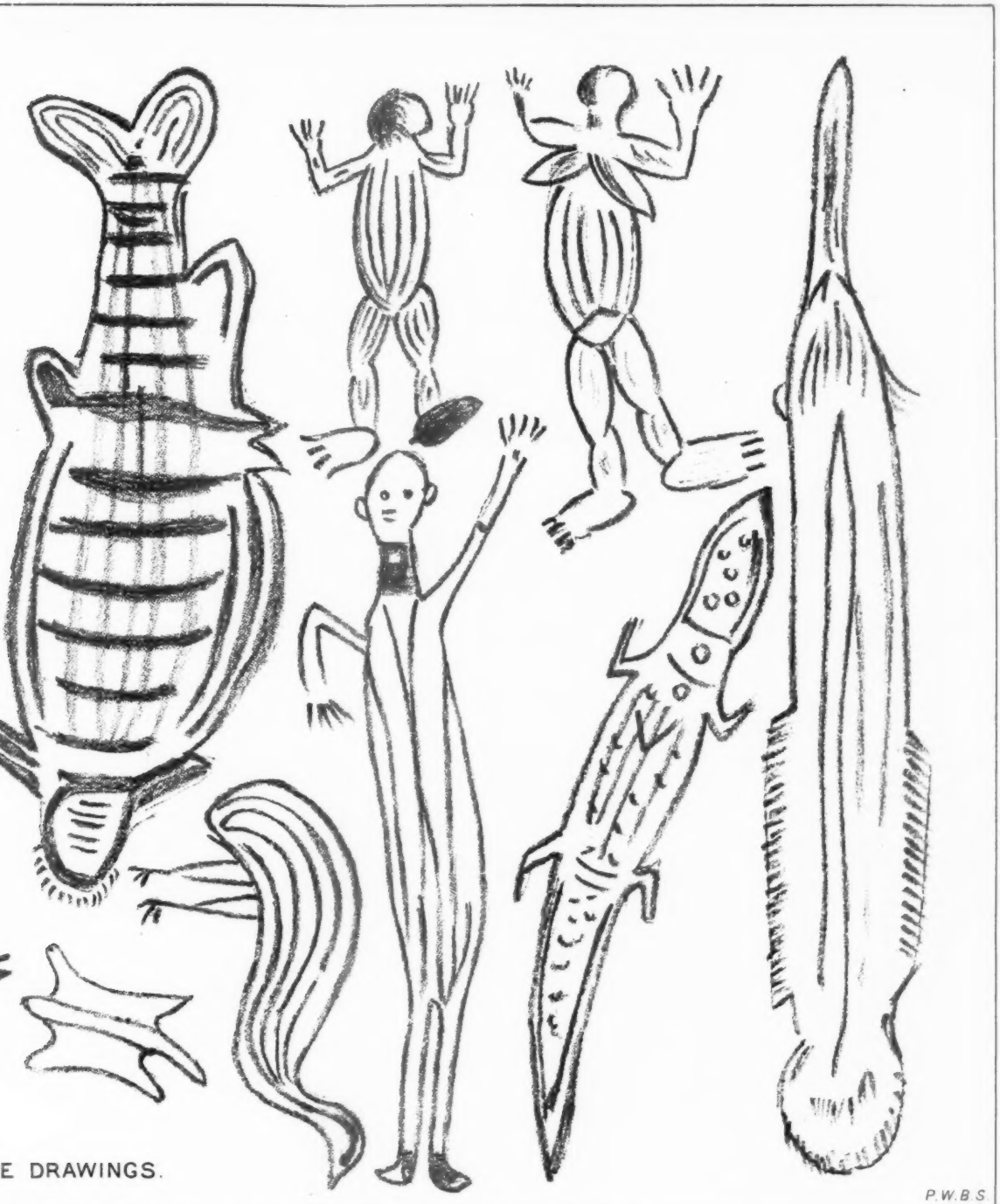
(Sketches are preserved in the Institute's collection.)

The colour of the skin varied from a brown black to almost a pure black, though frequently coated with ochre, which they are very fond of doing. The hair of the head was thick, coarse, and curly; the beard, generally present, thick and wiry; the head long and prognathous; eyes, deep set; nasal bones depressed; nostrils, large dilated; and lips, thick. Their legs have practically no calf muscles, yet they can walk great distances; their carriage, especially among the young women, or "lubras," being graceful and pleasing, as springy and upright as possible; they are all very expert in the water, dive and swim admirably, but rarely ever run; they seem to be of a contented disposition, laugh and talk a great deal, especially at night time, singing and noise going on the whole of the dark hours often, in fact they seem to sleep much more during the day than at any other time.



WOOLWONGA TRIBE DRAWI

Harrison & Sons. Lith. St Martins Lane



E DRAWINGS.

P.W.B.S.

ith, St Martins Lane, W.C.

The scars are usually very numerous, standing out much above the general level of the skin; they are inflicted with stone knives (quartzite), earth being rubbed into the wound; the first ones I was told were made on the shoulders at about seven years old, frequently one yearly, and at puberty they are made on the belly: the "lubras" are also scarred, but not so much as the men. Circumcision, or splitting the prepuce as a rite, is universal, and is usually performed early in the morning, at 4 or 5 a.m., the whole tribe being gathered together. Women, when pregnant, are debarred from eating many kinds of meat, kangaroo, &c., and a mother-in-law must not speak to her prospective son-in-law. Polygamy is allowed, though not common, and cases of adultery are generally punished by death.

There were, as far as I saw, no idols, or signs of any religion, but they believe in a Devil Devil, who comes out of the water, and goes about at night, they therefore are afraid to do so themselves; they are very superstitious with regard to diseases; no man can die unless he has been bewitched; someone is supposed to come at night and take away the fat out of the man's belly, and his friends must find out who did it to kill him—this blood price often extending to the whole family of the suspected one.

The men are great hunters; when after kangaroo, they daub themselves all over with the red earth, and carry a bough if in the open, and rarely return without being successful. At one "billibong," or water hole, I saw a boy creep in, swim across under water, and stealthily get among the reeds on the other side; having seized a duck sleeping there, he carried it about for a short time hugging it, then plucking it alive, he put it in the ashes to cook, thus showing his cruel nature. Another man finding a bandicoot's hole, thrust his arm in, and in spite of bites, pulled the animal out, singed it in the fire, *bit* open the abdomen, removing the entrails, thrust it in the ashes again for a few minutes, and then ate it tail first. A quantity of fish were caught, one an Osteoglossum, about 2 lbs. weight, I was anxious to secure in perfect condition, but a native seized it with his teeth just behind the head dividing the backbone, their usual way of killing big fish.

The only ornaments worn were bands of plaited grass round the arms and legs and a girdle of hair and fibre round the loins, which when once on cannot be removed; the lubras had short cloth petticoats (not native make). The front incisor teeth were not defective.

Their weapons consisted of very long wooden spears, about 12 feet long, ornamented with red and yellow ochre, and white bands, being strongly barbed either on one side, both sides, or

three pronged and barbed, or else having a quartzite head fixed on by gums and fibre; short spears either partially of bamboo or wholly of hard wood; these were not barbed, but occasionally pointed with bone; these latter are mostly used for kangaroo hunting.

Supple wands about 4 feet long terminating in a nipple are used, these are called "Woomeara," and are for throwing the spears, which is done with great accuracy and force. This is the more remarkable as the length of the spears and Woomeara causes them to be in constant vibration while in the act of poising for aim. With the long spears 70 yards was the greatest distance I saw thrown, the small ones aimed up in the air went quite out of sight; the natives, however, apparently did not like showing their powers, and did not do their best.

Some flattened clubs were seen, which I believe are only used among the Alligator tribe further west. I did not see any shields or stone axes, and they do not use the Boomerang or Kiley. Besides their weapons, the only articles they make seem to be coarse baskets and creels for carrying shell-fish, fruit, &c.; they apparently felt the want of nothing (except tobacco, an artificial craving), and have no money or trading instincts.

During my stay there, I gave paper and chalks to them, and obtained a number of specimen drawings, for the representation of natural objects is much practised among the Australians, and is one of the lowest intellectual developments; some of the figures are particularly grotesque, but the meaning was generally evident. The accompanying are selected from them. The dugong is curious considering the great distance from the sea of this tribe; it is therefore likely that the dugongs come some way up this, the Adelaide River. Their vocabulary was very small, and they could not count more than five, after that came "many." The people were mostly named after birds and places.

At Roebuck Bay the country was very flat with thin bush, the shore being fringed with mangrove swamps, or sand from the coral reefs, the latter being covered with cockleshells innumerable, which further inland were collected into "middens," and flies were omnipresent, the effects of which on the natives are so well described in Dampier's Voyages; these were even more repulsive than those of the Adelaide River. The men were almost black, with much hair on the face when grown up, rather above the ordinary height, with exceedingly thin legs and small hands; they were extensively scarred and often wore nose sticks, but did not file or remove any of the teeth.

The following are a few measurements I was able to take there:—

	Height.	Length of Head.	Width.	Index.
	ft. in.	ins.	ins.	
No. 1 Man	5 $4\frac{3}{4}$	$7\frac{7}{16}$	$5\frac{13}{16}$	77
„ 2 „	5 $5\frac{3}{4}$	$7\frac{11}{16}$	$5\frac{3}{16}$	66
„ 3 „	5 $8\frac{3}{4}$	$7\frac{9}{16}$	$5\frac{13}{16}$	76
„ 4 „	5 $5\frac{1}{2}$	$8\frac{1}{16}$	$6\frac{2}{16}$	65

Not far away in the bush there was a camp of rather large size, and in it during the day-time many women, children, and dogs, with a few of the old men. There were about twenty rude huts, or shelters of three chief kinds, the first consisted of branches, leaves, grass, or pieces of corrugated iron put up into the forks of small trees, throwing a shifting shade; secondly, collections of old pieces of cloth, canvas, mats, &c., also up in trees or bushes about 3 feet from the ground; thirdly, branches, old canvas, and other refuse more or less supported by artificially placed posts; these were surrounded with wood, ashes, shells (*area granosa*), and rubbish of all kinds. Their clothing was even more scanty than that of the Adelaide River natives, even the women scarcely having a rag on, the men occasionally wearing a pearl shell ground down. When in mourning the women or "lubras" plaster red clay in their hair, which then hangs down in small detached heavy masses, looking most extraordinary; they had scarcely any ornaments, armlets, and sometimes also wearing kangaroos' teeth as charms; the children when very young are carried in hollow wooden trays or cradles about 2 feet long; they are entirely without protection, and seem to be frightfully neglected: it is wonderful how they live at all. The women except when in mourning have the hair quite short. Their weapons were very primitive, being made of wood only, the spears being about 10 feet long, often very crooked, unbarbed, the ends being merely pointed and hardened (these are thrown *without* a "Woomeara") "Boomerangs," or Kileys, of various sizes and shapes, over which they have most perfect control, the very small boys being expert at killing fish, &c.

"Throwing sticks" about 2 feet long are quite straight, heavy, and hard, these they make to spin much like the Boomerangs.

The absence of stone or glass headed or even barbed spears is remarkable, likewise the absence of the Woomeara.

For defence they have thick wooden shields about 2 feet 6 inches wide, the ornamentation being always the same, cut more or less deeply in; the bar for holding them was always much too small for a European hand.

Landing one day in a small harbour on Cape Bougainville, north of the Admiralty Gulf, where natives were fairly numerous, judging by the numbers of fires visible from time to time, I came across a camp only recently left, indeed I believe the natives were hiding in the mangrove swamp behind; the fires had evidently only been out a short time, and around were cockleshells, fruit pods, and several large "Volute" shells used for carrying water, also a smooth rounded quartzite stone for pounding the fruit, &c., 5 inches long and 4 inches thick; leaning up against one of the remarkable Baobab trees (*Adansonia Gregorii*), was a long board, 12 feet by 9 inches wide, and 1 inch thick, with square holes cut near each edge, about 2 inches apart; this I think must have been acquired from a "pearler" and was now being perforated for making a raft (?); there were several of these large Baobab trees at the back of the beach, and others were seen further inland; carved into the bark of one at the back of the camp were a number of figure drawings which I copied; there was one small shelter, a few leaves and some grass heaped up on a shrub, about 3 feet from the ground; no weapons were found in or near it. Soon after I visited a small rocky island in the Admiralty Gulf; it was entirely composed of a fine Quartzose sandstone showing marked horizontal bedding, but much fractured, forming deep clefts and isolated masses; on the coral sand were tracks of turtle and numbers of bones, also many foot-marks of natives, converging to a beaten path, which went to the top (50 feet high), where there seemed to have been a regular factory for making spear-heads, hammers, &c., for among the chips I picked up quite a number of slightly imperfect ones; below there was a tree with grass in it, and under its shade, ashes and Volute shells; but the most interesting evidence of the natives was in small caves, or places where the sand had been excavated from under projecting ledges of the rock; here fires had been, and many people had lain, and on the roof, which was from 2 to 3 feet above the floor, had been worked in red, black, or white pigments various drawings, and among them the representation of a clothed man probably meant for a "pearler."

At Baudin Island a little further north, where a "tide pole" party from the ship had been camped the year before, and where quantities of bottles, tins, old iron, &c., had been left, we found that the natives had left everything complete except the bottles; they were *all* gone, only a few fragments remaining, some

showing distinctly that the natives had been manufacturing spear-heads from them, evidently not understanding the value of iron. At Wyndham (Cambridge Gulf) glass spear-heads are very common. It is curious that the people of Bigge Island when they attacked our boats had none but the ordinary wooden weapons, crooked spears, throwing sticks, &c., of Roebuck Bay, yet a very little further north they were well versed in making stone and glass spear-heads.

During the whole season no canoes of any sort were seen, but near Cape Bougainville, Bigge Island, and Baudin Island rafts were noticed a few times, yet many of the islands are evidently frequently visited for turtle, stone, &c.

My actual opportunities were so few of going on shore that I am able only to offer such a very meagre description of this interesting and comparatively little known part, and regret my inability to do it justice.

The following are words from different places I was able to obtain :—

	Woolwonga.	W. Alligator River.	Roebuck Bay.
One	*And-or-e*	*Min-bar-a*	*Gung-ar-e.*
Two	*Gar-unklal*	*Goor-at*	*Gung-ar-o.*
Three	*Garung-argaring*	*Goor-at-minbara*	*Gudit-e.*
Four	*Gar-unklal-argaring*	*Goor-at-Goor-at*	*Munda.*
Five	*Nabul-argering.*		
Many			*Gor-ing.*
Fire	*Wack*	*Goo-ginock*	*Gunko.*
Water	*Week*	*Garra.*	
Food	*Moy-ah*	*Moyah-gerrit.*	
Tree	*Umbal*		*Bābo.*
Spear	*Boko.*		
Man	*Nul.*		
Woman	*Alomandobu.*		
Boy	*Wor-riba.*		
Girl	*Almaren.*		
Dog	*Ing-ar-e.*		
Kangaroo	*Tur-ning.*		
Iguana	*La-leen.*		
Duck	*Ger-benck.*		
Goose	*Numbul.*		
Turkey	*Bā-bunck.*		
Lake	*Au-lunga*	*Gor-roo-ya.*	
Sleep	*Dongiga*	*Yung.*	
Hot	*Ur-wa-lack*	*Goo-naridock.*	
Cold	*Ur-lul*	*Warro.*	
Large	*Anāgan.*		
Little	*An-woko.*		
Fish	*Gur-bunck.*		

JAPANESE ONOMATOPES *and the* ORIGIN *of* LANGUAGE. By W. G. ASTON, C.M.G.

THIS paper was suggested by the following passage in Dr. Tylor's "Primitive Culture":—

"The time has now come for a substantial basis to be laid for Generative Philology. A classified collection of words with any strong claim to be self-expressive should be brought together out of the thousand or so of recognised languages and dialects of the world. In such a Dictionary of Sound-words, half the cases cited might very likely be worthless, but it would show on a large scale what particular sounds have manifested their fitness to convey particular ideas by having been repeatedly chosen among different races to convey them."

CHAPTER I.

Phonetic System of Japanese.

The phonetic system of the Japanese language is by no means well adapted for onomatopœia. The older language adheres strictly to the rule that every syllable must consist of a vowel or of a consonant followed by a vowel, as E-no-shi-ma, thus excluding all final consonants, all double consonants, and all combinations of consonants.

Onomatopoetic effects such as we have in scrunch, shock, slap, clap, snap, &c., were therefore impossible. The sounds *p*, *x*, *ng*, *th*, and *l* are wanting in the older Japanese, and there are only five vowel sounds, viz., *a*, *e*, *i*, *o*, and *u*.[1] Certain combinations of consonants and vowels are avoided. *F* is only found before *u*, and *h* before the other vowels. For *si* a Japanese says *shi*; for *ti*, *chi*; for *di* or *zi*, *ji*; for *tu*, *tsu*; and for *du*, *dzu*. *Tsu* and *dzu* are merely the Japanese way of saying *tu* and *du*, and the combination of consonants is therefore more apparent than real. The phonetic resources of the modern language are somewhat more extensive. It admits of double, but not of combined consonants, and it has one final consonant, viz., *n*. The letter *p* has also been revived (the prehistoric language probably had it), partly in imitation of the Chinese, and partly because it was

[1] The Royal Geographical Society's spelling has been followed. Pronounce vowels as in Italian, consonants as in English. As a rule avoid the shut sounds of vowels.

found suitable for onomatopes, to which its use in Japanese words is almost exclusively confined. This is an instance of onomatopœia providing a corrective to the general tendency of phonetic decay.

The modern language supplies most of the examples in the following lists. A good number are taken from a collection kindly lent me by Professor Chamberlain.

Notwithstanding the poverty of its phonetic system, the Japanese language is rich in onomatopes. The popular literature abounds with them, and the speech of the people has many more which rarely find their way into books.

Chapter II.

Words Representing Significant Inarticulate Vocal Sounds.

An onomatope may be defined as the artistic representation of an inarticulate sound or noise by means of an articulate sound.[1] But it will be convenient first to consider a small but important class of onomatopes, if they should be called so, to which this description is not quite applicable, viz., the articulate sounds which represent inarticulate significant human vocal sounds. The English words Oh! no! hush! (in Japanese *O*, *ina*, *na* or *nu*, and *woshi*) may be taken as types of this class of words, for which it could be wished that there were some better general term than Interjection. They come before ordinary onomatopes in the development of human speech, and differ from them, firstly, in being formed from sounds which are already significant, and secondly, because they are not so much imitations as modifications of these sounds by a gradual process. It will be readily seen that they occupy quite a different position in the history of language from onomatopes like bow-wow, cock-a-doodle-doo, rat-tat, &c. The latter, as is obvious from their very nature as articulate and artistic imitations of inarticulate sounds, belong necessarily to a period when a system of articulate sounds had been already established, and considerable progress therefore made in the acquirement of the art of speech. Indeed most of them are of quite recent origin, and bear upon them the distinctive marks, not merely of the language to which they belong, but not infrequently of its most modern form. Whether any were originally inarticulate imitations of non-human sounds, which subsequently received a more articulate character, may be

[1] There is a kindred art, viz., that of the *exact* imitation of animal cries and other sounds, successfully practised by some of our undergraduates and other young people, as well as by tame ravens and parrots. It probably played some part in the development of language, but I can only mention it here.

left an open question. The analogy of the lower animals leads us to infer that mankind occupied themselves for a long time with their own natural cries before taking the trouble to imitate for purposes of expression sounds not of their own making. It is true that the parrot in captivity and under human tuition learns to imitate other cries and sounds than its own, and even occasionally to attach some sort of meaning to them. But a natural progress even as far as this very limited degree of development is quite another thing, and marks a much more advanced condition of intelligence.

It would appear, therefore, that while onomatopœia in the ordinary sense of the word may and does explain the origin of a vast number of individual words, it can throw little or no light on the problem of the origin of the art of speech. How did mankind from expressing a few simple ideas only by a few inarticulate sounds become able to express many and complicated ideas by a variety of articulate sounds? Put in this way, the question suggests its own answer, viz., that it must have been by the simultaneous differentiation of the ideas on the one hand and of the sounds on the other. But such general formulæ have little value, when unaccompanied by some evidence of the manner in which this development took place. Before enquiring, however, whether any traces of such a process are to be found in the Japanese language, which from its more transparent nature as an agglutinative tongue may be presumed to afford greater facilities for such an examination, let me draw attention for a moment to the significant natural cries which form as it were the raw material of this process. We have them still with us, as certain merits of their own have prevented them from being altogether superseded by more conventional modes of expression. Proof is afforded of their primitive character by the fact that they are everywhere almost[1] identical.

The natural cry should not be confounded, as is sometimes done, with the articulate word which is its outcome. The cry oh! extorted from us by pain or fright differs sensibly from the oh! of polite conversation. The latter may seem the simplest of sounds, and it may be difficult to conceive of a time when it formed no part of the human vocabulary. Many would affirm that it is a mere natural utterance with nothing conventional or artificial about it. Yet we shall find that in order to say oh! we must, firstly, compress the lungs by means of the muscles of the abdominal wall and the internal intercostals and triangularis sterni in the chest—secondly, the vocal chords must be rendered tense by the crico-thyroid muscles, thirdly—— But I will spare

[1] The bifurcation of human language may be traced even in these non-articulate utterances. Cocks of different breeds do not crow alike.

this Institute the enumeration of the muscles required to bring the vocal chords into the proper position for vibration, to lower the jaw, to draw down the tongue into the floor of the mouth where it will be out of the way, to part and protrude the lips, and to close the passage of the nose. Suffice it to say, on the authority of one of our most eminent anatomists, that this simple-seeming oh! requires for its production the combined action in an instant of time of about forty muscles. The steps in this complicated process as far as lowering the jaw (inclusive) are necessary to produce even an inarticulate oh. To the pre-articulate man the others must have been unknown or practised by him in a meaningless hap-hazard fashion. He had not learnt to differentiate his utterances so elaborately. Even the civilised man from negligence or under excitement readily omits some or all of these precautions and reverts in a greater or less degree to the natural unsophisticated cry. But for the civilised articulate oh! of ordinary speech they are all indispensable. It is obvious that no one person could have invented all these contrivances and imposed them on his fellow men. They must have been introduced one after another at various times and in many independent quarters. Mankind in general adopted them gradually by a process which must have extended over hundreds of generations, and is not quite complete at the present day. This is a totally different thing from the formation of a word like cock-a-doodle-doo, which is as much a work of individual genius as Hamlet or the Laocoön. The result, however, is the same, viz., the substitution of an articulate for an inarticulate sound.

These natural cries were perhaps originally not significant. But it is unnecessary here to carry further back an examination which may better be left to the enquirer who will continue the work begun by Darwin in his "Expression of the Emotions."

Natural cries may be classified as follows:—1st, Shouts and shrieks; 2nd, Grunts; and 3rd, Hisses. This division corresponds in a general way to the vowels, nasals, and aspirates of more articulate speech.

Shouts comprise all inarticulate sounds made with the mouth freely open; in grunts, the sound comes through the nose, the mouth being closed or nearly so; in hisses, the aid of the vocal chords is dispensed with, and the passage of the mouth much contracted.

Shouts and Shrieks.

In Japanese, shouts are represented chiefly by the interjections *a* and *o* as in so many other languages; shrieks by *i*. Shouts differ from grunts and hisses in being audible to a much

greater distance, a circumstance which greatly enhances their importance.

The first differentiation of the shout was by means of variations of tone, which are still essential in this class of words. It matters little whether you say oh! ah! or aw! if you only give the right intonation.

The principal words of this kind in Japanese are—

A or *ā* ... . An exclamation of pain, grief, or admiration, corresponding to our Ah! It is the base of the interjections *ana*, of surprise or grief, *aware*, of pity, *appare*, of admiration, and *aita*, of pain. The last, however, is a combination of *a* with the root of the conventional word *itaki*, painful.

Aara .... In a modern poem this word occurs as an onomatope for a dying groan.

Wa .... After a word *A* becomes *Wa*, in order to avoid a hiatus, which is as objectionable in Japanese as in other languages. It has a purely exclamatory force in *Ara!* for *Are wa*, that, *Kora*, for *Kore wa*, this, taunting phrases something like "there you go!" Its more usual force, however, is that described by a native grammarian as follows, "*Wa* has somewhat of an exclamatory force and is a particle which possesses the meaning as it were of choosing out and separating a thing or an action from among a number." As a distinctive or separating particle it is very frequently used to mark out the subject of a sentence, and has therefore been taken by some writers for the sign of the nominative case. It is not really so, however, as it is joined to other cases as well. It would be more correct to describe it as an imperfectly developed case sign.

After verbs *Wa* usually assumes the form *ba*, and it then becomes the sign of the conditional mood.

Wā or *wā-wā*[1] .... A clamorous shout. Hence *wameku* ([2]O.L.), to clamour, to shout. Cf. French brouhaha.

Ya .... This word varies in meaning from an exclamatory to an interrogative particle. In the latter capacity it takes a place in the grammatical system of the language.

Ya is sometimes a mark of the vocative case, and it also

[1] The functions of reduplication are very restricted in Japanese grammar. It has been stated that the plural of nouns is formed in this way. But this is not quite correct. It is true that the pronoun *ware* has such a plural and a very few nouns are reduplicated with the same meaning as is given by our prefixing the word "every," or "some," in English, as *Kuni-guni*, every country; *hito-bito*, everybody; *toki-doki*, sometimes. Some verbs have their roots reduplicated, as *tataku*, to beat; *sosogu*, to rinse; *mamoru*, to watch; *tattobu*, to honour; *tsutsuku*, to tap; probably with the original intention of indicating repetition, continuance, or intensity. As a general rule in Japanese, there is reason to suspect onomatopœia wherever we find reduplication, which is itself an onomatopoetic procedure.

[2] O.L. These initials mark words which have been received into the ordinary language, and are no longer regarded as mere onomatopes.

forms, along with the *ba* of the conditional mood above referred to, an optative termination. Thus *tori-kaye ba-ya* means "oh that I could exchange!"

The Corean[1] language has also an interrogative *ya*.
From *ya* are derived *aya*, *iya*, *uya*, and *oya*.

Aya .... An exclamation of wonder. Hence *aya-shiki* (O.L.), strange, wonderful, *ayashimu*, to despise.

Iya .... An exclamation of regret or (usually unpleasant) surprise.
Yā, *yai*, an exclamation of horror, should probably be placed here.

Uya-uya .... Respectfully, generally met with in the derivative adjective form, *uya-uyashiki*, respectful, reverential, and the verb *uyamāu*, to respect, to venerate.

Oya or *oya-oya* An exclamation of mild surprise like our "dear me!", commonly used by women at the present day.

O or *wo* .... An exclamation of surprise or admiration, like our oh! It is *o* before and *wo* after a word, in obedience to the necessities of the Japanese phonetic system.
From the *O!* of admiration comes *oho*, root of *ohoki*, great, and from the latter the honorific particle *o*. There is a curious example of a similar transition of ideas in the Chinese character 大, great, which is said to be the representation of a man, 人, holding up his hands in an admiring posture. Our own honorific Mr. is also traceable to a word meaning great.
A long *ō* having the meaning great, a short *ŏ* came to mean small, as in Obama, "little shore," the name of a place.
The Japanese verb has no grammatical forms to mark person. But as *o* and the other honorifics are almost always associated with the second, rarely with the third, and never with the first person, they afford a useful indication of the person of the verb, and may be regarded as the germs of what in a later stage of development might become true grammatical forms.

Wo .... (After a noun). Originally a mere exclamation, *wo* becomes first a particle slightly emphasizing the word which precedes, and secondly, the sign of the objective case.[2] It is also used with verbs as an adversative particle having somewhat the same face as our "but," "whereas."

Yo .... An exclamation of entreaty something like "do, please." After a noun it forms a sort of vocative case and with verbs of the second and third conjugations, it is the sign of the imperative mood.

[1] Corean is a distant relation of Japanese. The grammatical structure of the two languages is almost identical, but there is proportionately a strange paucity of common roots. Some deny that there are any.

[2] See my grammar of the Japanese written language, page 124.

There are in Japanese numerous exclamations indicating assent or, like the sailor's "Aye, aye, sir," comprehension or obedience to an order. These fluctuate between different vowels. Thus we have *oï*, *aï*, and *aüh* (familiar), and *he* and *hai*,[1] which are more respectful. *O*, *e*, and *a* are also used for the same purpose. In short the only vowel not used as an affirmation is *i*.

Oi .... A shout, calling to a person at a distance, like our "halloa!" Cf. Greek ἄνω, to shout.
Nō-nō .... Ditto.

The history of the vowel *i* presents greater difficulties. It does not stand by itself as an exclamation, nor is there the same consensus of other languages in regard to it which is so conspicuous in the case of *a* and *o*. But it may perhaps be recognised in combination with other elements in the initial vowels of the words *ina*, "no," *iza*, "no," *iya*, an exclamation of surprise (generally unpleasant), *iya-iya*, a mother's cry of warning to her baby, and *imu* (O.L.), to avoid. From *iya* are derived *iyana*, nasty, *iyagaru* (O.L), to dislike, *iyashiki* (O.L.), base, mean, and *iyashimeru* (O.L.), to despise. The natural cry to which this *i* corresponds seems to be the shrill note of warning observable in many gregarious animals and not extinct even in man. There is a marked preference in several languages for the vowel *i* in the onomatopoetic representation of shrieks and other high-pitched sounds. In English we have shriek, screech, scream, squeal, squeak, shrill, chirp, creak, peewit; in Greek there is λιγὺς shrill, and in Japanese *ki-ki*, for a shriek, *kishi-mekn* (O.L.), for to creak, *kiri-kiri*, a creaking sound, *kirigirisu* (O.L.), the name of a kind of grasshopper, *pin*, the sound of a slender (treble) string, *pon*, being given as the sound of the thick (or bass) string, *piu*, the sound of a railway whistle, and *chiu*, the chirping of sparrows, or the squeaking of rats.

The fact that the exclamation *ya* passes into an interrogative particle lends some faint colour of probability to the suggestion that it may be the same *i* which pervades the interrogative words *itsu*, when; *idzure*, which; *iku*, how many; *ikaga*, how; and *ikahodo*, how much.

[1] *Hai, hai, hai*, repeated at intervals of a second or two, is also the Japanese horse boy's cry of warning to his beast. The right tone is essential here. It may be mentioned that the Corean muleteer's, pack horse man's or bullock driver's call to his animal, which sounds to the stranger like a prolonged inarticulate *Yaw!* is in reality *iri oō*, *i.e.*, come hither. *Oō* is a polite form of the imperative, as we say "sir" to a dog.

E or *Ē*.[1] .... An exclamation of grief, repentance, anger, dislike, etc., also, though in a different tone, a query like our Eh? This exclamation is perhaps a variant of the *i* just described.

Hē .... (Rising accent.) An exclamation of surprise and admiration.

Grunts.

The grunt is the easiest of all vocal utterances. It is the sound made by the vibration of the vocal chords in the normal condition of the organs of speech, *i.e.*, with the passage of the nose open (as it usually is to allow of breathing), and the mouth shut or the lips only slightly parted. It is no doubt this ease and simplicity of pronunciation which has made the grunt so tenacious of life throughout the long ages of human history. When a man says "h'm," instead of "yes," the reason is simply an indolent reluctance to take the trouble of opening his mouth, closing the nostrils and making the necessary movements of his tongue and lips.

The first attempt to differentiate this sound was not in the direction of making it articulate, *i.e.*, by converting it into *n*, *m*, or *ng*. Variety was produced by differences of tone and emphasis and by reduplication. In this way several distinct sounds arose each with its appropriate meaning. I shall confine myself here to two of these—the grunt of assent, in a low note, and the grunt of dissent on a higher key. The first of these we render in English by "h'm," often doubled for greater emphasis. It may be traced to an earlier stage of development in the low murmur of animal satisfaction which some human beings and dogs, and, with a difference, all cats utter when caressed. The "hum" by which our ancestors showed their approval of a good sermon, is obviously a near relation of this sound. The grunt of dissent, on the other hand, had probably its origin in the snort or growl of displeasure common to man with some of the lower animals.

The grunt of assent is represented in Japanese by *u* or *un*. From this, according to a native etymologist, are formed the words *u-be* (O.L.), "Right! good!" and *ubenaü* (O.L.), a regularly inflected verb meaning "to give assent."

I have elsewhere[2] attempted to show that the Japanese language had once a verb *nu* (root *n*), "to be" (the copula, not the substantive verb), now superseded by its derivative *naru*, but not without leaving traces in the Japanese grammatical system. *No*, the partitive or genitive particle is simply another form of this *nu*, the Japanese language affording frequent

[1] The vowel *e* I take to be a more recent development than *a*, *o*, or *i*.
[2] In my grammar of the Japanese written language, 2nd Ed.

examples of the exchange of *no* for *nu*. *Ni*, the locative particle, is also derived from it. I now suggest that this verb *nu* is the grunt of assent become articulate, and that it is very possibly the same element which in the form *u* is the characteristic termination of the indicative or affirmative form of the verb. The vocalization of *n* into *u* is a familiar feature of Japanese etymology.

The grunt of dissent is the parent of words of negation in a large number of languages.[1] In Japanese we have *ina*, no, and *inamu*, to refuse, which form a parallel to the *ube*, right, and *ubenaü*, to assent, quoted above. The negative adjective is *naki*, not being, and the negative termination of verbs *nu* or *anu*. Thus *naku* is to weep; *nakanu*, not to weep; *taberu*, to eat; *tabenu*, not to eat. *Na* is the negative imperative particle prefixed or suffixed to verbs.

The modern Japanese word for no is *ïye*, but as this has little apparent expressive quality, the English word no, generally reduplicated, has become a great favourite with the Japanese. Along with "Hear! hear!" it is frequently heard in the Japanese Diet. The Corean word for no, not, is *ani*.

There is a negative future or potential termination *majiki* (*mai* in the modern colloquial), of which *ma* is the essential part. This I am inclined to regard as a variant of the above. Cf. Corean *mot*, "cannot, may not"; *malta*, "to be unable to do," "to be prevented," "not to do." This word is often used in the Imperative, viz., *malla*, "don't." Cf. also the Greek μὴ.

There is a modern colloquial interjection *mā*, which is sometimes a cry of remonstrance or deprecation, but is used in so many different ways that it is impossible to say what its proper meaning is.

I may note here, though, as ordinary onomatopes, they properly belong to the next chapter, the verb *naru*, "to sound," the noun *ne*, "a sound" (especially a musical sound), *naku*, "to sing" (of a bird), or "to weep" (of human beings), *unaru*, "to groan," "to moan," "to make a long reverberating murmur like a bell when struck"; and *udaku*, "to roar" (of a wild boar).

Hisses.

The hiss is produced by sending the breath forcibly through the mouth, which is greatly contracted at some part. The vocal chords are silent, and there is therefore no differentiation by means of tone as in the case of the shout, shriek, and grunt.

The hiss is usually represented in articulate language by *s* or *sh*, although instances are not wanting of the use of other

[1] See Tylor's "Primitive Culture," 3rd Ed., vol. i, page 123.

aspirates for this purpose. The original inarticulate sound is employed for "hissing" on a dog (in French, *Kss*), or for driving off fowls (for which Tennyson gives the curious provincial variant "*Pluksh*"). It is also used for ordering silence, being in this case at first perhaps a mere noise to drown the voice of an unwelcome speaker.

To the first of these cries we should probably refer the Japanese interjection *sa*, *sā*, or *iza*, used like our "Come! get on!" in urging one to do something. From this are derived *izanāu*, "to invite," *sasōu*, "to incite," and also perhaps *susumeru*, "to encourage," and *shiuru*, "to compel." The Corean interjection corresponding to *sa* is *ŏsŏ*. The Greek **σένω** had no doubt its origin in a cry of this kind.

I would now suggest, with some diffidence, that the verb *suru* (root *s* or *sh*), "to do," and the distinctive terminations of Causative and Transitive verbs which contain this element, are to be referred to the same source. As examples of these verbs I may instance *miseru*, "to show," from *miru*, "to see," *kasu*, "to lend," from *karu*, "to borrow," *korosaseru*, "to cause to kill," from *korosu*, "to kill."

I may here relate a personal anecdote which illustrates the change of an inarticulate hissing sound into an articulate *f*, and other onomatopoetic matters. Some years ago it was my fortune to fall under the dominion of a domestic tyrant, aged two, for whom it became my task to provide amusement. I one day took her up under the arms and swung her round me, making as I did so, almost unconsciously to myself, a hissing sound which had no doubt been familiar to me in my childhood, and which was probably meant to convey the idea of something whizzing through the air at a great rate. The little thing was mightily pleased and when put down, said promptly, "Do it again." "Do what again?" replied I. She at once answered, "Do *f-f-f* again," the sound here represented by *f-f-f* being neither the hissing sound I had made, nor an articulate *f*, but something between the two. The next time, however, it developed into a wholly articulate "*iff*," which after a few minutes became obsolete, my liege lady having chosen to discontinue it in favour of a new acquisition, the more conventional word "swing."

The sibilant sound enjoining silence, from which comes our English "hush," is rendered in Japanese by *woshi*, *oshi*, or *shidzu*, with the last of which may be compared the French "chut" and the Greek **σιζω**. From *shidzu* are derived *shidzu-shidzu*, quietly, *shidzukani* (O.L.), do., *shidzumaru*, to become quiet, to settle down, and *shidzumu*, to sink. The same *shidzu*, by an easy transition, signifies respect. Thus I find in a narrative of

the Christian rebellion of Amakusa in the seventeenth century that the Christians honoured one of their leaders by bowing their heads and uttering the sound *shidzu-shidzu*.

The modern Japanese onomatopoetic rendering of a hiss is *shiu*.

This is perhaps the place to mention the interjection *sha!* of contemptuous surprise—like our *Pshaw!*

CHAPTER III.

Imitations of Non-Significant Human Vocal Sounds.

It seems probable that this class of words comes next[1] in order of development after the representatives of significant inarticulate sounds, and that the invention of mute consonants was associated with this stage in the progress of the onomatopoetic art. They are absent from words of the preceding class, and it is unlikely that they were first used for the imitations of noises and non-human sounds where anything at all resembling a mute consonant is extremely rare, being only met with, and then but approximately, in the cries of a few birds. In the case of the non-significant human vocal sounds, however, such as blowing (for the labials), spitting (for the tip-of-tongue sounds), gulping (for the root-of-tongue sounds), and coughing (for the glottis mutes, and indirectly for the root-of-tongue sounds), the model was at hand, and I have little doubt that it was in the imitation of these and similar sounds that the mute consonants had their origin. As the Chinese Book of Odes has it:—

> "In hewing an axe-handle,
> In hewing an axe-handle,
> The pattern is not far off."

It is probable, however, that these sounds were made in sport before they were applied to any practical purpose.

At this point we meet for the first time with a new element of onomatopœia, viz., the imitation of motions by motions of the organs of speech. Onomatopes, like other words, have two aspects. They are not only sounds, but motions of the organs of speech. As sounds, they are cognizable by the sense of hearing both of the speaker and of the hearer; as motions they

[1] By the division of language into four stages, viz. (1), Natural Cries; (2) Interjections; (3) Imitations of non-significant human vocal sounds; and (4) Imitations of other sounds, it is not meant that all the words constituting each of these classes were formed in this order, only that *some* Interjections were the first words to come into use; next, *some* imitations of human non-significant vocal sounds of which the words in the list at the end of this chapter are modern representatives, rather than specimens, and next, *some* imitations of other sounds. The corresponding progress from vowels, nasals, and aspirates (in this order?) to mute consonants must be understood with a similar qualification.

are perceptible by the sense of touch (including the muscular sense) of the speaker in the first place, and, indirectly, of the hearer also, by means of the associations of touch excited by the impressions which come to him through the ear. In the case of labials, and to a less extent of other consonants, the sense of sight of the person addressed is also appealed to. This element of onomatopœia has not received the attention which its great importance demands.

It may be useful to take here a short survey of the principal consonants in their aspect as motions of the organs of speech, and for greater convenience I append a table in which the letters of the Japanese language are distinguished by being put in italics.

	Labials.	Tip-of-tongue sounds. (Dentals.)	Flat-of-tongue sounds. (Palatals.)	Root-of-tongue sounds. (Gutturals.)	Glottis sounds.
Hard Mutes ..	*p*	*t*	*ch*	*k*	Sound of coughing.
Soft Mutes ..	*b*	*d*	*j*	*g*	Sound of clearing the throat gently.
Hard Aspirates	*wh*, *f* *h*	*s*	*sh*	χ	*h*.
Soft Aspirates	*w*, v	*z*	j (French)	g, as in German lager	Spiritus lenis.
Nasals	*m*	*n*	ñ	ng	None.

The glottis mute is found in Arabic, but in no other language, in so far as I am aware.[1]

R and *L* are tip-of-tongue letters, but they present peculiarities which make it proper to omit them from the above table.

[1] The terms dental, palatal and guttural are objectionable, as they refer to parts of the mouth which are wholly passive in the act of pronunciation, and their use therefore tends to divert the attention from the far more important functions of the active organs of speech.

The vowels have hardly any importance as expressive of motions, and the nasals almost as little. The aspirates with *r* and *l* may stand for motions as well as sounds, but the principal mode of expressing motion is by means of the mutes. Indeed, the latter are hardly ever used to represent sounds except for the imitation of certain animal cries in which we indulgently recognise an approach to articulate speech, and in some of the class of words described in the heading of this chapter.

The labials are naturally adapted for expressing motions in which the lips take part, such as blowing, spitting, pouting, spewing, or making a "moue." They are also fitted to represent such ideas as can be expressed by puffing out the lips and cheek, as bulge, burst, bubble, bulb, bulk, ball, &c.

The tip of the tongue is the smallest and most mobile of the organs of speech, and is therefore best adapted for representing nimble, agile, or delicate movements of small, easily moved objects. The tip is in this respect a contrast to the root of the tongue. But the lips are almost as mobile. Words expressive of pointed things or their motions often contain a tip-of-tongue sound.

The flat-of-tongue, *i.e.*, the forepart of the tongue pressed flat against the palate, is used in one or two Japanese onomatopes to express closeness or stickiness. (See below.)

R and *l*, like the other tip-of-tongue sounds, are easy of pronunciation, but they have a special onomatopoetic character as indicating continued tremulous motion.

There is no *l* in Japanese, and no *r* in Chinese. Coreans pronounce the same letter *l* or *r* according to its place in the word. This would seem to indicate that the distinction between *r* and *l* is of recent origin.

The chief characteristic of the root of the tongue as an organ of speech is its comparatively greater bulkiness, as compared with the lips and tip-of-tongue. It is therefore associated with ideas of weight, bigness, power, &c., also of clumsiness or awkwardness. It is the dislike of the trouble of putting such a large mass of muscle in motion that has gained for gutturals their bad name as a dysphonious class of sounds. That this irksomeness has a very real influence on speech is shown by the phenomenon presented by languages wholly unconnected with each other, of the gradual working forward of root-of-tongue sounds till they become flat-of-tongue, or even tip-of-tongue, sounds. Cf. Latin, *carus*, French, *cher*, Latin, *Cicero*, English pronunciation *Sissero*, German *Karl*, English, *Charles*, French, *Charles*, Chinese Peking, modern mandarin dialect Peching, *Loochooan hachi-machi*, for Japanese *hachi-maki*. Even the English *k* and *g* have slipped forward somewhat from the deeper sounds of these letters still heard in Scotland.

The root-of-tongue onomatopes also express motions in which that organ or the adjoining parts are concerned.

The onomatopoetic bearing of the classification into mutes, aspirates and nasals need not detain us long. In the hard mutes, the motion of the organs of speech begins or ends abruptly in a short, sharp shock, whereas in the soft mutes the beginning or end is slower, heavier, and less abrupt.

A final nasal is suitable for expressing motions which gradually die away, as swing, spring, &c. But these last named consonants greatly resemble vowels and are more often met with as onomatopes of sound.

The aspirates, in which the mouth is greatly contracted and which have not the vibration of the vocal chords to swell their sound as is the case with the nasals and vowels, require a comparatively greater effort to make them continuously audible. This sense of effort is utilized onomatopoetically in such words as stout, strong, stiff, shove, push, strain, stress, stamp, stubborn, spring, smash, shock, shatter, thud, thrust, thump, &c., to express effort, violence, or force. Compare also the Greek ἀσθμα, panting for breath, from ἄω, to breathe.

When with the effort required for the aspirate there is combined that necessary to put the comparatively unwieldy root-of-tongue in motion, as is the case in pronouncing χ, most languages refuse altogether to admit such a sound to their phonetic repertory. The Latin tongues are notoriously averse to it, and it is also absent from Japanese, Chinese, and Corean. Our own language, which had it not very long ago, eventually discarded it as quite too troublesome. But for the very reason of its difficulty its expressive force is undeniable, as we may see by comparing the German ach! and the Irish och! with our feeble and colourless ah! and oh! And the onomatopoetic fitness of such words as the Greek ἄχος, grief, ache, and μόχθος, labour, a burden, will not be disputed.[1]

It may contribute to a clearer apprehension of the nature of the mutual relations of the elements of sound and motion in onomatopes if we examine as closely as may be the familiar English words *rap*, *rat-tat* and *knock*. All are unmistakably expressive, and they have all a strong resemblance to each other. In what does their expressive quality consist? Mainly, I should say, in the quality and length of the vowel sounds. Substitute for *a* and *o* any other vowel sounds, and it will be found that most of the onomatopoetic effect is lost. *Roop*, *root-toot*, and *knook* would

[1] It would take me too far from the present subject to show that much of the so-called euphony of language is in reality the convenience of motion of the organs of speech, and that melody of verse is largely a harmonious dance of the same organs with a charm quite independent of the accompanying sound.

not answer the same purpose, nor would *rip*, *rit-tit*, or *knick* do, though the last has an onomatopoetic value of its own, as may be seen by Goethe's lines—

> "Wir knicken und ersticken
> Doch gleich, wenn einer sticht."

Even the same vowels if lengthened out as in the French words *râpe*, *rate*, or in *knaulk* for *knock*, will lose most of their expressive quality. On the other hand, the short, shut sound of *a* or *o* might be put alone unsupported by any final consonant without wholly marring the effect.

The Japanese language has to content itself with open syllables for similar onomatopes as in *ta-ta-ku*, to rap, to knock.

So much for the vowels. The final consonants, it will be observed, are all hard mutes, one being a labial, one a tip-of-tongue sound, and one a root-of-tongue sound, the onomatopoetic effect being almost the same in each, thus showing that it depends more on the quality of the sounds as hard mutes than on the organs of speech with which they are produced. It appears to me that the function of the hard mutes is here two-fold. They make it easier to give the vowels the requisite short, sharp sounds, and the abruptly ending movement of the organs of speech in pronouncing them expresses the abrupt termination of the motion which produces the rap, rat-tat, or knock. They can hardly be expressive of sound, for there is no *p*, *t*, or *k* in the sound represented. If we try to imitate it exactly, a dull *u* sound will be the result, for which we substitute the more articulate *ă* or *ŏ*. For choice, I should say that the final *t* (in rat-tat) produced the best onomatopoetic effect, not on account of its sound, but because the motion of the tip of the tongue in pronouncing *t* is more like that of the knocker of a door than that of either the root of the tongue or the lips in pronouncing *k* or *p*.

The office of the initial consonants is not so clear. *R* may be intended to convey the idea of the continuous motion which precedes the final shock, while the initial *k* of knock, which we now reject in pronunciation, may be the remains of a reduplication.

Everybody has felt the onomatopoetic propriety of the words invented by Swift in "Gulliver's Travels" for his kingdoms of giants and pigmies. As sounds they have no more resemblance to the things indicated than the colour scarlet has to the sound of a trumpet, but if we consider them as onomatopes of motion we shall find some clue to their expressive quality in the preponderance of root-of-tongue sounds and soft mutes in Brobdingnag and in the total exclusion of these elements from Lilliput, which is composed of tip-of-tongue sounds (with one

labial) and hard mutes. Perhaps Swift had also in view the remote resemblance to the words big and little—themselves not without onomatopoetic quality.

The onomatopoetic effect of the well known line,

Quadrupedante putrem sonitu quatit ungula campum,

is due, first to the number of dactyles, which are equally expressive of sound and motion, and secondly, to the large number of hard mutes adapted to express the motion of the numerous sharp blows of the horses' hoofs on the ground. There are here eleven hard mutes—the ordinary Virgilian line averaging half this number—and there are only two soft mutes. Tip-of-tongue letters are also in the majority. Thirdly, the sound is rendered by six nasals, the usual average of these sounds, in a line, being a little less than four. The choice of vowels has probably also contributed to the effect. The first two of these procedures are used by Tennyson in his "Northern Farmer,"

"Dosn't thou 'ear my 'erse's legs as they canters awaäy,
Proputty-proputty-proputty—that's what I 'ears 'em saäy."

Here the shut vowels express the sound.

Swinburne, on the other hand, characteristically gives prominence to the resonant quality of the nasals, combined with the cantering rhythm of the dactyle, in his "Hesperia,"

". . . . . the music, as eight hoofs trample and thunder,
Rings in the ear. . . . . "

Although the Japanese language in its modern form is not unacquainted with such sounds as *mp*, *nd*, and *ng*, they are not used for onomatopoetic purposes, and the Japanese poet, if he would avoid the imputation of writing doggerel, must deny himself the use of all words containing combinations of consonants and adhere strictly to the rule that every syllable must have not more than one consonant and must end with a vowel. The result of this restriction is visible in the following lines of an ancient Japanese poet, where, to express the sound of a horse's hoofs, we find—

Uma no oto no
horse of sound

To-to tomo sureba—
onomatope even when it makes.

That is, "whenever there is the sound of a horse going 'trot-trot.'"

There is a wide difference between this naive repetition of the syllable *to* (*t* for motion and *o* for sound) and the highly elaborate and artistic workmanship of Virgil. *To-to* is clearly not the canter, but some other pace—perhaps a trot.

It is now possible to formulate the rule of letter-changes in the onomatopoetic elements of like words in the same or different languages. As already pointed out by Dr. Tylor, the principle of ordinary Philology which leads us to look for correspondences between sounds produced by the same organ rather than between sounds of the same quality is by no means universally applicable to them. On the contrary, the general rule for onomatopes is that mutes correspond with mutes, aspirates with aspirates, and nasals with nasals, for the obvious reason that in so far as resemblances of sound and quality of motion go, *p*, *t*, and *k*, *f*, *s*, and *χ*, *m*, *n*, and *ng* are more alike than *p*, *f*, and *m*, *t*, *s*, and *n*, *k*, *χ*, and *ng*. Or we may put it in this way—the correspondences follow the upright and not the horizontal columns of the above table.

The only exception to this rule is where the onomatopœia consists in the imitation of, or is in some way connected with, the motion of a particular organ of speech. In this case the variations will naturally be within the limits of sounds produced by that organ, as may be seen by comparing the English spit with the Japanese *betsu-betsu*, both of which are imitations of the motions of the lips and tongue in spitting.

This sounds very simple, but in practice complications arise owing to the peculiarities of the phonetic systems of individual languages, the presence in onomatopes of conventional elements, and, in the case of words which have been received into ordinary language, the action of the usual laws of letter-change.

Examples.

Labials.

Fū-fū .... The gesture and sound of blowing.

From this are derived the words of the ordinary language *fuku* "to blow," *fuye* "a flute," *fukureru* "to be puffed out," "swollen," *fufumu* "to swell," as a bud, *fukuro* "a bag," *fukumu* "to contain," *futoki* "big," "thick." Cf. Corean *puta* "to blow," *param* "wind," and words with initial labials for blowing and wind in many languages.

The onomatopes for the sounds of wind instruments given below also belong to this group.

Fū .... The motion (and sound ?) of expelling from the mouth an ill-smelling odour—equal to our Faugh, Bah, Pah.

Peppe .... Ditto.

Hi (O.L.) .... Fire.

The words for fire have in many languages a labial, probably in imitation of the gesture of blowing a fire. It will be remembered that the Japanese *h* is a labial. The Corean for fire is *pul* (*puta* "to blow"), Malay *api*, Aino *abe*, Greek πῦρ, &c. The Latin *flare* and *flamma* are probably connected with each other, and the English blast and blaze.

Hiru (O.L.) .... To sneeze, also = Latin *pedere*, with the noun *he* (Fr. *pet*) are also to be referred to this group of words.
Apu-apu .... Gasping for breath, as of a drowning man.
Butsŭ-butsŭ .... An angry murmur.
Butsŭ-kusa .... Muttering, grumbling.
Guzu-guzu .... Ditto.
Muji-muji .... Mumbling.
Bera-bera .... Mumbling as in a strange language. Cf. Barbarian.
Becha-becha .... Chattering, gabbling.
Domoru (O.L.) ... To stammer.
Damaru (O.L.) .... To be silent.
Shaberu (O.L.) .... To gabble.

Tip-of-tongue sounds.

Betsŭ-betsŭ .... Motion (and sound ?) of spitting.
Petsŭ-petsŭ .... Ditto.
Atsŭ-atsŭ .... Ditto.
Tsuba (O.L.) .... Spittle.

The first two of these words combine a labial with a tip-of-tongue sound like the English spit, and the Greek πτύω. The *ŭ* in the Japanese words is almost inaudible.

At-to .... Cry of pain. *To* is an adverbial suffix equal to the English "with a," as *pon-to*, "with a bang."
Hot-to .... Cry of relief, of the same force as the French Ouf!
Ot-to .... Ditto.
Not-to .... A sigh (?)

It is however rather by their quality of hard mutes to indicate the quick catching of the breath, than of tip-of-tongue sounds that the *t*'s in the above four words are expressive.

Root-of-tongue sounds.

Gubi-gubi .... Motion of swallowing, motion in the throat at the sight of something good to eat or drink.
Gubi-tsuku (O.L.) To twitch (of the throat) from thirst. Compare with these words the English gobble, gulp, and the French gober.
Kuĭ, O.L. (*Kufu Kupu*) .... } To eat, to bite, should probably come in here.
Ka-ka .... Sound (?) of drinking water.
Gatsŭ-gatsŭ .... Crunching sound while eating.
Gari-gari .... Sound or motion of eating.
Gori-gori .... Eating something hard, hardness.
Mugu-mugu .... Eating. Cf. Corean *mŏk-ta*, to eat.
Gara-gara .... Loud, harsh laughter.

Gukku .... } Suppressed laughter, giggling. The root-of-tongue
Gutsŭ-gutsŭ .... } sound is chosen as best fitted to represent the
Kutsŭ-kutsŭ .... } motion of suppressing laughter by closing the
Gera-gera .... } throat.
Wera-wera .... Joyous laughter.
Waraü (O.L.) .... To laugh. Cf. Greek γελάω.
Ge-e-i .... Yawning. Cf. German gähnen, English gape, gasp.

There is no actual *g* sound accompanying a yawn, but the mouth is thrown open in such a way that no other sound is possible.

Kon-kon-kon .... Coughing. *K* represents both sound and motion.
Haku (O.L.) .... To vomit. Cf. English puke.

The element of motion predominates in this word. Cf. Jap. *aki*, disgust, Greek κόρος, satiety, German ekel, disgust.

Hakŭsho .... Sneezing.
Kushami (O.L.) .... A sneeze.
Shakuri (O.L.) .... A hiccough.

Aspirates.

(*Sibilants.*)

Uso .... Whistling.
Koso-koso .... Whispering.
Kossori .... Secretly, stealthily.
Sasa-sasa .... Whispering.
Sasa yaku (O.L.) To whisper. Cf. Latin susurrare, Fr. chuchoter.
Suü (O.L.) .... To suck. Cf. Latin sugere.
Suya-suya .... Gentle breathing.
Sŭ-sŭ .... Breathing.
Hā-sū .... Heavy breathing.
Zei-zei .... } Wheezing.
Zeri-zeri .... }
Un-su .... Groaning.

Nasals.

Fum-pun or *Pun-pun* .... } Of strong odours, good or bad. The nasals seem here to indicate the part taken by the nose in snuffing up the odours.

Vowels.

In the following words the vowel sounds seem more important than the consonants.

Hogyā-hogyā .... A child's squalling.
Hogī-hogī .... Ditto.
Kui-kui ... . Crying or whining from pain.
Ki-ki .... Sound of screaming.
Gami-gami .... Scolding or yelping.
Ā-ā .... Yawning.

The motion as well as the sound is appropriate to a wide open mouth.

Gō-gō .... Snoring. Also a rumbling as of the bowels.
Gū-gū .... Ditto.
Ha-ha .... Laughing.
Ho-ho .... Ditto.

The *h* was evidently never *p* in these words.

Chapter IV.

Imitations of Animal Cries.

Bekkakō .... The crowing of a cock. English *Cock-a-doodle-doo*, provincial *Cock-a-leary-low*, French *Coquerico*, German *Kikeriki*, Spanish *Quiquiriqui* Yoruba *Koklo*, Zulu *Kuku*, Finnish *Kukko*, &c.[1]

There is much in these words that is merely conventional The number of syllables varies greatly and also the choice of vowels and consonants. The points of resemblance are the rhythm, the long open vowel at the close, and the predominance of a *k* sound. It may be questioned however, whether the crowing of a cock really contains this letter. It sounds in this, and other bird cries, more like the audible opening of the glottis for which our alphabet has no letter, though I believe there is one in Arabic, where we transliterate by *k*. In English we render the same sound by *c* in cough, and by *h* in ehem. The Japanese language also makes it a root-of-tongue sound in the onomatope for coughing, viz., *kon-kon-kon*. Is "crow" (Hebrew *iqara*) an abbreviated onomatope?

Bekkakō is also used as a derisive word accompanied by the gesture (not unknown to ourselves) of pressing down the lower eyelid with the fore-finger.

Kake (O.L.) .... The common fowl. Cf. English cock, cackle.

I take these words to be abbreviated imitations of the cry of the hen when she has laid an egg. It is the same cry which the cock utters in response, and is also the note of indignation of both sexes when there is no question of egg-laying. The *k* in this case seems to me to be a true root-of-tongue sound and not the glottis sound above described. The final *e* of *kake* is a phonetic necessity of the Japanese language which will not allow a word to end with any consonant but *n*. This word is now obsolete.

To-to-to .... This is the cry with which the Japanese call fowls to be fed.

[1] Vide Tylor's "Primitive Culture," 3rd Ed., vol. i, p. 207. I take this opportunity of acknowledging my numerous obligations to the chapters on language in this work.

It is obviously an imitation of the cry of a hen to her chickens, or of a cock to his dames for the same purpose. Cf. Engl. *chuck-chuck*, provincial *tyook-tyook*, with *tyooky*, a nursery word for fowl, Chinese *chu-chu*, Corean *ku-ku*. The Japanese word for bird, viz., *tori*, may perhaps be derived from this.

Hiyo-ko (O.L.) .... A very young chicken, a peeper. *H* in Japanese is a labial, and probably represents a prehistoric *p*. *Ko* means little one. Cf. French piailler.
Kako (O.L.) .... The cuckoo. There is no *k* in the cuckoo's note. As usual, it is a glottis sound which is thus represented.
Hototogisu[1] (O.L.) .... A species of cuckoo (Cuculus poliocephalus).

Blakiston and Pryer state that "the note is very different from that of the cuckoo, being the syllables *ho-tuk-tuk* constantly repeated as it flies from bush to bush." My own impression of its cry is, that it oftener runs to five or six syllables than three, and I would prefer to say that it has *some resemblance* to *ho-tuk-tuk*. The termination *su* also occurs in the onomatopoetic words *uguisu* "a nightingale," *karasu* "a crow," *kigisu* or *kigishi* "a pheasant," and *kirigirisu* "a grasshopper." It may be the *shi* or *su* of the verb *suru* (root *shi*) to do. *Hototogisu* would then mean the bird which makes the sound *hototogi*.

Poppo .... (Pronounce pope-poe.) The pigeon's cry.

The Latin *pipio* looks like this, but has probably a somewhat different origin.[2] The Japanese word for pigeon is *hato* (for *pato* ?) and the Corean *piteulki*, where *to* and *teulki* mean "bird."

Kā-kā .... Cry of the crow—our caw-caw.

The *kara-su* (obviously an onomatope) or Corvus Japonensis is a bird intermediate in size between the Carrion Crow and the Raven. I have observed that the word for black (in Japanese *kuroki*) in several Asiatic languages seems derived from the name of this bird. Note that the French *Croua*, for the crow's cry, also contains an *r*.

Kachi-garasu (O.L.) .... This is one Japanese name for the magpie, a rare bird in Japan. It is really the Corean word *kachhi*, magpie, prefixed to the Japanese *karasu*, crow. *Kachhi* is obviously onomatopoetic.
Ga-ga .... The quacking of ducks.
Uguisu (O.L.).... .... The Japanese nightingale (Cettia cantans).
Chiu-chiu .... Chirping of sparrows.
Gan (O.L.) .... A wild goose.

This word is of Chinese derivation. Cf. Greek χήν, Engl. *gander*, &c. The dictionaries derive χήν from χαίνω "to gape,"

[1] There are two other cuckoos in Japan, with names taken from their cries. See Blakiston and Pryer in "Japan Asiatic Society's Transactions."
[2] See Tylor's "Primitive Culture," vol. i, p. 207.

but both *gan* and χὴν are surely onomatopoetic, the initial root-of-tongue motion being the only one consistent with the gaping position of the beak of the bird as he utters the cry, and the *an* or ην representing the cry itself.

Nasals are not common in onomatopes of birds' cries, the reason probably being that a bird's nostrils are very small, and the nasality of their utterances therefore a negligable quantity. It is a certain metallic ring in the cries of some birds which we attempt to render by nasals. This quality in the cry of the wild goose was recognised by Homer, who speaks of the κλαγγὴ of wild geese and cranes, and by White of Selborne, who says the cry of the goose is "trumpet-like and clanking." Note that *gan* is also the Japanese onomatope for the sound made by a metal vessel falling to the ground.

Kin .... The cry of the pheasant (Phasianus versicolor).

Probably *kigisu* or *kigishi*, an old word for pheasant, may be derived from this. The Corean word for pheasant is *kiŏng*. The crowing of the cock-pheasant is well represented by a Corean word *tŏl-kŏki* the syllable *kŏk* being made long and strongly accented.

Mŭma (O.L.) .... A horse. Cf. Chinese *ma* and Corean *mal*. A doubtful onomatope.

Hin-hin .... The neighing of a horse. Cf. English *hinny*, *neigh*, French *hennir*.

Kon-kon ....
Ken-ken .... } The fox's cry.
Kai-kai ....

Wan-wan .... The barking of a dog. Cf. English *bow-wow*, Shakespearean *bowgh-wowgh*, French *Ouah-ouah*.

It is curious to observe the variety of ways in which the ending of so familiar a sound is rendered. *N* is a nasal tip-of-tongue sound, *w* an aspirate labial, *gh* an aspirate root-of-tongue sound, and *h* a glottis sound. The Japanese choice of *n* for this purpose is the choice of Hobson, there being no other final consonants in Japanese. It may be noted that whereas the Japanese reduplication is simple, the English reduplication, here and in other cases, is with a difference.

Hoyeru (O.L.) .... To bark, may perhaps be compared with the French *aboyer*.

Kiyan-kiyan .... A dog's whining or yelping.

Niau ....
Nya .... } The mewing of a cat. Cf. Chinese *miao*, which stands both for the cry and for the animal.

Ne-ko (O.L.) .... A cat. Possibly the *ne* is the same as the *nya* just mentioned. *Ko* means a little one.

Goro-goro .... The purring of a cat. Cf. French *ron-ron*.

The cat's mouth is shut when it purrs, and therefore the tremulous sound which we represent by *r* cannot proceed from the tongue.

Chiu-chiu .... The squeaking of rats. Cf. the Corean word for rat, viz., *chiui*.

Giu-giu .... The croaking of frogs.
Gya-gya .... Ditto.
Bum-bun .... The buzzing of insects. Cf. Latin *bombitare*, Greek *βομβέω*, English *hum*, Scotch *bum*. If Grimm's Law had any application to these words, the last should be *pum* instead of *hum* or *bum*. *Bun* is Chinese and Sinico-Japanese for mosquito. Hence the facetious saying that his buzzing is meant as a polite self-introduction to his intended victim.
Kirigirisu (O.L.) .... A grasshopper.

CHAPTER V.

Imitations of Musical Sounds.

The limitations of the Japanese phonetic system appear very distinctly in this class of words. There is no final *m* or *ng*, so that onomatopes like *tom-tom* and *ding-dong* are impossible.

Gö....ö....n.... .... Sound of a large bell.
Bon .... Ditto.
Gan ....
Chon .... } Sound of a small bell.
Chin ....
Chan ....
Shan-shan .... Sound of bells hung to a horse's neck (grelots).
Don-don .... Sound of a drum. Cf. *tsutsumi* (O.L.), the name of a small drum struck with the finger-tips. Cf. also the English rub-a-dub.

Den ....
Ten-ten .... } Sound of a drum.
Ten-kara ....
Kan-kan .... Sound of the *tsutsumi*. See above.
Pon .... Ditto.
Chin-chin-chin .... Striking of a clock.
Chan-ten chan-ten .... Twanging a *samisen* (Japanese guitar).
Pempera-pempera .... Ditto.
Tsutsu-ten .... Ditto.
Pon .... Sound made by a thickish (bass) string when struck.
Pin .... Sound made by a thin (treble) string when struck.
Piu .... Sound of a railway whistle.
Bū-bū .... Blowing a horn or conch.
Bu ....
Bū .... } Sound of a wind instrument. The initial consonant is for the gesture of blowing, the vowel for the sound.
Pi ....
Pū ....

Fuye (O.L.) .... A flute.
Hora (O.L.) .... A conch. Cf. *Hora-hora*, an onomatope for a hollow sound.

The following English onomatopes of musical sounds from Ralph Roister Doister are added for the sake of comparison:—

Twangle dome twang Sound of a lute.
Toodle loodle poope .... Sound of a recorder.
Thrumple dum thrumple dum thrum .... } Sound of a gittern.

Chapter VI.

Imitations of Noises and Motions (other than those of the organs of speech).

I have endeavoured in the following list to make a distinction between onomatopes in which the elements of sound-imitation and motion-imitation respectively predominate, but I do not pretend to think that I have done so very successfully. Nearly all contain both elements.

The general principle (subject to exceptions) is that the mutes represent motion, and the vowels and nasals sound, while the aspirates and *r* (Japanese has no *l*) may stand for either.

Noises.

Ja-ja .... Plash of water.
Shā-shā ... . Ditto.
Shu-shu .... Water trickling or running away.
Shū-shū .... Hissing sound of water on something hot.
Pyô to .... Whizzing of an arrow.
Gan .... Sound of a metal vessel falling to the ground. The verb βομβέω is used for a similar sound in Homer.
Kararin .... Sound of metal falling.
Gatan .... Sound made by falling as on a wooden floor.
Gara-gara-pin .... Noise of locking a door.
Pon-pon .... Sound of firearms. English *bang-bang*, French *pan-pan*.
Don-don-don .... A continual thumping noise.
Dô to .... With a "thud." Cf. Greek δοῦπος, a sound made in falling to the ground.

Domburi to ....
Zambun to ....
Zambu to .... } Sound of falling into water with a "plump."
Dobun to ....
Pokan to ....

Dzubu-dzubu .... Onomatope used of a ship sinking.
Chin-chin .... Water simmering.
Gō-gō .... Sound of a torrent.
Gō-meku (O.L.) .... To make a loud creaking or rumbling noise.
Goro-goro .... } Rumbling as of a cart, the bowels.
Koro-koro .... }

Compare Burns' phrase "some curmurring in his guts" where, as usual in English onomatopes, a letter is changed in reduplication. Motoöri, the most famous of Japanese scholars and grammarians, thinks that this onomatope is the origin of the word *Kokoro*, heart. *Kokoro* is not applied to the material anatomical heart, for which the Chinese word *shin* is used, and Motoöri believes that it first meant the bowels and inwards generally. The belly is at this day the seat of wisdom with the Chinese and Japanese (as it was of feeling with the ancient Jews).

What business have the root-of-tongue sounds in these words? They do not exist in the thing represented. We should be very much surprised indeed to hear *k*'s or *g*'s issuing from that part of our organization. Nor is there anything in the motions accompanying the sounds in question to suggest mute consonants. The reason for their presence must be sought elsewhere. As shown above, the pronunciation of *o* requires a number of well-defined movements of the organs of speech. But within the limits thus laid down, there is still room for variety, one kind of which depends on the precise position of the tongue and lower jaw. If we wish to produce a deep, resounding *o*, which shall recall the hollow, rumbling noises indicated, we lower the jaw a little more and retract the tongue (which for an ordinary *o* lies on the floor of the mouth, with its tip touching the lower gums or teeth), so as to leave the cavity of the mouth large and empty. The result of this is to thicken out the tongue at the base so as almost to close the passage of the throat—in other words, to bring it nearly into the position for pronouncing *k* or *g*.

Todoroku (O.L.)	To rumble as of thunder, carts, beating a hollow vessel, &c.
Doyo	Noise.
Doyomu (O.L.)	To make a noise.
Hoku-hoku or *Poku-poku*	Said of the sound of the hollow "fish-head" of wood used in temples for a drum.
Saya-saya	A rustling noise as of silk, leaves on a tree, &c. Cf. *sasa*, whispering.
Soyo-soyo	
Su-su	
Soyoro....	
Gasa-gasa	
Goso-goso	
Hiso-biso	Secretly, stealthily.

The whirring sound made by a wheel in rapid revolution, as represented by *r* or *l*, enters into onomatopoetic words in many languages. In Japanese (which has no *l*) we have—

Kuruma (O.L.)	A wheel, a wheeled vehicle, a mill.
Guru-guru	Rolling or turning over.
Guri-guri	Expresses roundness.
Gururi to	In a circle. Cf. Greek γῦρος, a circle.

Korori....	Of tumbling over.
Koro-goro	Of tumbling over.
Korobu (O.L.)	To tumble over.
Meguru (O.L.)	To take a circuitous route.
Kiriri	Twisting round.
Jirori-jirori	Rolling the eyes.
Gioro-gioro	Ditto.
Gorori-gorori....	Tumbling about when drunk.
Maru (O.L.)	A circle.
Mari (O.L.)	A ball.
Maruki (O.L.)....	Round.
Marobu (O.L.)	To roll over.
Maromeru (O.L.)	To make round.
Yoro-yoro	Rolling about unsteadily.
Yoro bōu (O.L.)	To reel as a drunken man.
Hioro-hioro	Reeling about.
Dzuka-dzuka	A tramping noise.
Doka-doka	Noise of clogs on a wooden floor.
Bata-kusa	Ditto.
Doya-doya	Ditto.
Bata-bata	Ditto.
Pata-pata	Sound of repeated flaps, slaps, claps, &c. The latter also conveys the idea of warmth according to Hepburn.
Poka-poka	Sound of repeated flaps, slaps, claps, &c. The latter also conveys the idea of warmth according to Hepburn.
Bachi-bachi	Clapping of hands.
Pachi-pachi	Crackling of flames.
Kachi-kachi	Sound of striking something hard, as an arrow on a hard target, castanets, &c.
Kachiri	Sound of striking something hard, as an arrow on a hard target, castanets, &c.
Kottsuri	Sound of striking something hard, as an arrow on a hard target, castanets, &c.
Tashi-dashi	Rattling of hail.
Gottsuri	Hard things knocking against each other.
Gokkiri	Hard things knocking against each other.
Poki-poki	Sound of cracking.
Guza to	(The *a* strongly accented.) Pricking, stabbing.
Gussari	Ditto.
Guzari....	Ditto.
Poro-poro	Sound of falling drops, dripping.
Boro-boro	Sound of falling drops, dripping.
Poto-poto	Sound of falling drops, dripping.
Pota-pota	Sound of falling drops, dripping.
Bota-bota	Sound of falling drops, dripping.
Pottari	Sound of falling drops, dripping.
Potchiri	Just a drop, something tiny.
Pottari	Ditto.
Pottsuri	"Spitting" rain, mice nibbling.
Potsu-potsu	A little (drop) here and there.
Para-para	Sound of heavy rain
Bara-bara	Of a loud crashing or rattling noise.
Sara-sara	Noise of moving a bamboo screen.
Kishi-meku (O.L.)	To make a creaking noise (as a cart-wheel).
Gata-gata	A rattling noise.
Zabu-zabu	Sound of wading in shallow water.
Sawa-sawa	Noisily (of voices).
Zawa-zawa	Noisily (of voices).
Sawagu (O L.)	To make an uproar.

Gaya-gaya .... An uproar, din of many people talking at the same time.
Wappa-sappa .... Sound of jollity.

Motions.

Hoto-hoto .... Tapping at a door.
Hata-to .... Striking.
Pata-pata .... Of repeated blows.
Bottari ....
Battari ....
Dossari .... } Of coming down with a "flop."
Pattari ....
Bassari .... Of anything soft falling to the ground.
Tata ku (O.L.) .... To thwack, knock.
Futa-futa .... Flapping of a fan.
Poko-poko .... Jogging along.
Dabu-dabu .... Of a horse jogging along.
Kappa-to .... With a flop.
Kat to .... Flaring up with anger.
Pot-to .... Sudden flushing.
Wat-to.... .... Bursting out crying.
Met-to or *Pat-to* .... Anything bursting out suddenly.
Dot-to .... Of a sudden burst of noise.
Piku-piku .... The beating of the pulse.
Zuki-zuki .... Painful throbbing.
Biku-biku .... Wincing.
Bikkuri .... Starting in alarm.
Gikkuri .... Ditto.
Pokkuri .... Of a sudden motion.
Puttsuri .... Of something snapping.
Buru-buru .... Of trembling. Cf. French *Brrr.*
Furuii (O.L.).... .... To tremble.
Wana-wana .... Of trembling.
Wananaku (O.L.) .... To tremble.
Dokkoi.... .... Putting out one's strength as to lift a heavy weight.
Gui to .... Ditto. Represents holding the breath previous to making an effort.
Hishi-hishi to .... Of making an effort.
Osu (O.L.) .... To push, shove. Cf. also Greek ὦθω, to push.
Surari to .... Of any swift, sweeping, unobstructed motion, as of drawing a sword.
Sura-sura to .... Smoothly, glibly.
Soro-soro .... Gently, slowly.
Shonara-shonara .... Of the gentle, easy walking of a woman.
Mishiri-mishiri .... Of quiet treading.
Jiri-jiri .... Of a gradual motion.

Note in the above six examples the absence of mutes which would convey an idea of abruptness.

Tatsu (O.L.) .... To stand up.

This verb is conjugated as follows :—Pres. Indic. *tatsu*, future *tatan*, perfect *tateri*, stem *tachi*, giving an irreducible element *tat*, which may be called the root. *Tsu* and *chi*, as already

pointed out, are merely the Japanese way of saying *tu* and *ti*. Is *tat* an onomatope? I believe it is. Now at any rate it has an onomatopoetic quality. There is no other motion of the organs of speech so well adapted to render the rising to an erect posture as the straightening out the tongue with its tip touching the teeth or gums, as is done in pronouncing *t*. In *tat* the motion is repeated, as is so frequently done in the case in onomatopes. Nor is the vowel sound quite a matter of indifference. If any sound is made in getting to one's feet, it is that of a stamp on the ground, to render which, *a* is obviously more suitable than *i*, *u*, *e*, or even *o*. Cf. Chinese *tah*, to put the feet on the ground, to tread. There is a Japanese onomatopoetic adverb *jidanda*, which prefixed to *fumu*, to tread, gives it the meaning of our "stamp." It is almost an exact equivalent of our "stand" when the phonetic differences of English and Japanese are allowed for.

An analysis of the English word "stand" yields similar results on the assumption that its primary meaning was "to get to one's feet." It is at any rate probable that it originally meant an action, and not a state. The initial *s*, indicative of effort, favours this view, and actions lend themselves more readily to onomatopoetic imitation than conditions of rest. Even if the action is not that of standing up, but of putting down one's foot firmly, and hence "staying," "stopping," the difference is not great. The *n* I take to be a mere euphonic ornament.

Neither French nor Japanese have any word for "stand." This idea is expressed in French by *se tenir debout*, and in Japanese by a similar phrase.

Utsu (O.L.) .... To strike.

The root is *ut*. It can hardly be owing to chance that the letter *t* is so prominent in words for striking and touching in many different languages. In Japanese we have, besides *utsu*, *ataru*, to hit or touch, *tsuku*, to thrust, *butsu*, to beat, and *tataku*, to rap, to thwack. Then there are the Latin *tundere*, to thump, *tangere*, to touch, *tax-tax*, an onomatope for beating, and *taxare*, to touch sharply. In Greek there is τύπτω, to strike, τυγχάνω, root τυχ, to hit the mark, and τιτύσκομαι, to aim at, to hit the mark. The Chinese for strike is *ta* or *t'ah*, and the Corean *chhi-ta*, where the aspirates, like the initial aspirate in strike, seem intended to convey the idea of force.

It may be admitted that the motion of the tongue in pronouncing *t* represents but feebly the acts of standing up or striking. But every art has its limitations. The materials at the command of the onomatope-maker are confessedly scanty, and he has got to make the best of them.

CHAPTER VII.

Unclassified Words.

THE words in the following list have no very obvious expressive quality. Some are doubtless sham onomatopes—mere conventional words in disguise—but as they are nearly all words of recent origin for which no derivation can be assigned, it seems improbable that this can be the case with many. The Japanese themselves recognise them as distinct in kind from words of the ordinary language by printing them in different type, and in other ways.

It is also possible that in some cases the connection between the word and its meaning may have been owing to chance circumstances independent of derivation, and without the aid of any natural fitness in the word itself to convey the idea attached to it. But it does not seem probable that this can have been of frequent occurrence, or if it did happen, that the words so formed would often have permanent currency.

It is more probable that the majority are genuine onomatopes. A change of sound or meaning may have obscured their original expressive quality, or, owing to differences of fashion in the matter, what sounds inexpressive to us may have a quite recognizable meaning to the Japanese. Our music gives them little pleasure, and *vice versâ*. It is also to be remembered that when first invented they would be accompanied by aids of gesture and vocal intonation, and would be used under circumstances calculated to make the most of whatever expressive quality they possessed. Opportuneness is a highly important factor in making such words intelligible. Even the best onomatopes cannot afford to dispense with assistance of this kind. "Bang" is not a bad onomatope, but if you say it to a person ignorant of its signification, in a quiet tone of voice and apropos of nothing, he will not know what you mean. But if you raise your voice, and make the gesture of firing a gun, you will probably be understood, and he will certainly understand you if your imitation immediately follow the actual discharge of fire-arms.

Bonyari	Dulness.
Bot-to	Dim, mazed, dull.
Pokan to	In a vacant, absent manner.
Shā-shā	Brazen-facedly.
Bisshori .... }	Thoroughly drenched.
Bisho-bisho .... }	
Jiku-jiku	Wet, moist, damp.
Bichi-bichi	A springing, jerking motion, as of a live fish thrown on the ground.

Bottori....	}	In a soft, quiet, silent manner, or like anything soft and wet falling.
Bottari		
Bottara		
Pocha-pocha		Round and fat, as of the face.

The Japanese language has hundreds more of these words.

Chapter VIII.

Children's Words.

Onomatopes

Wan-wan		A dog.
Nyā-nyā		A cat.
Chiu-chiu		A rat.
Shii		*Mingere*—an imitation of the encouraging sound made by nurses.
Un-ko		*Faeces*. *Ko* means small, *un* is possibly onomatopoetic.
Bā		Hot water for drinking. Perhaps from the gesture of blowing to cool it.

Words altered from the ordinary language.

Nenne....		To sleep, a baby, from *neru*, to sleep. &c., &c.

Words of uncertain origin.

Ototsu	Father.	} Cf. English dada, Greek ἄττα.
To-to	Ditto.	
Te-te	Ditto.	
Chi-chi	Ditto.	
Okka	Mother.	
Ha-ha	Ditto.	The last is probably for an older *papa*.

Chichi and *ha ha*, although originally children's words, now form part of the ordinary language. *Chi-chi* also means milk, the breast.

Some of the above words may have originated in the child's earliest articulate utterances being fitted on by his parents or nurses to his first wants or ideas very much at random, and without reference to expressive quality. The reduplication was perhaps meant to give them a false air of being onomatopes, and also to afford the hearer two chances instead of one of catching the word.

Chapter IX.

Recapitulation.

The more important of the principles of language illustrated in this paper may be briefly recapitulated as follows:—

1. The first speech of mankind consisted of natural cries, which I have classified as shouts, grunts and hisses. These were developed into interjections (oh! no! hush!) by a two-fold process. The ideas became more distinct and definite, and the sounds, at first differentiated only by tone, became articulate.

2. From such interjections there have been derived a very considerable proportion of the grammatical forms and particles of the Japanese language, such as case signs, honorific and interrogative particles, the signs of the indicative (?), optative, conditional and imperative moods, and of the causative (?), and negative verbs. A good many words of the general vocabulary may be traced to the same origin.

3. A further stage in the development of language consists in the imitation of such non-significant vocal sounds and motions as blowing, spitting, gulping, and coughing.

4. It is here that mankind found a model for the mute consonants.

5. It was also at this stage that the imitations of motions by motions of the organs of speech began.

6. In onomatopœia mute consonants are usually expressive of motion, vowels and nasals of sound, the aspirates occupying an intermediate position.

7. Ordinary onomatopes such as rat-rat, bow-bow, &c., are of late origin, and can throw little light on the genesis of speech.

8. Letter correspondence in like onomatopes of the same or different languages follows the classification into mutes, aspirates and nasals. It is only where there is some special reason for this that the variations occur between sounds made by the same organ of speech as in ordinary philology.

JANUARY 9TH, 1894.

Professor A. MACALISTER, F.R.S., *President, in the Chair.*

The Minutes of the last Meeting were read and signed.

The following elections were announced:—

J. R. MORTIMER, Esq., of Driffield, Yorkshire.

Dr. LENNOX BROWNE, F.R.C.S. Ed., Mansfield Street, W.

The presents that had been received were announced and thanks voted to the respective donors.

The following papers were read :—

"Ethnological notes on the New Hebrides," by Lieut. BOYLE T. SOMERVILLE, R.N.

"Funeral Rites and Ceremonies amongst the 'Tshinyaï' (or Tshinyungwe), and other notes," by LIONEL DECLÉ.

ETHNOLOGICAL NOTES *on* NEW HEBRIDES (*continued*).

By Lieutenant BOYLE T. SOMERVILLE, R.N.

INDEX OF CONTENTS.

I. General Account of Islands Visited.
II. Population, Causes of Decrease, &c.
III. Traditions and History.
IV. Clothing, Ornaments, &c.
V. Painting and Tattooing.
VI. Dwellings.
VII. Navigation, Canoes.
VIII. Fishing, Swimming.
IX. Weaving and Basket work.
X. Pottery.
XI. Stone Implements.
XII. Fire.
XIII. Food, Drinks, &c.
XIV. Cannibalism.
XV. Music and Musical Instruments.
XVI. War and Weapons.
XVII. Cultivation.
XVIII. Burials.
XIX. Boys' Games.

Medical notes by Surgeon Daniel J. P. McNabb, R.N., late of H.M.S. "Dart."

I. *General account and description of Islands visited.*

DURING the survey of the "Dart" in 1890 and 1891, the parts of the New Hebrides visited included Efáte, with its adjoining small islands of Nguna, Mau, Matáso, Mai, and Mákura; then a little farther to the north, the Shepherd group of Tongoa, Tongariki, Ewosi, Buninga, and Valea, together with the south coast of the large island of Epi; and lastly the east coast of Malekula, between Port Sandwich and Port Stanley, a distance of about 35 miles.

With the exception of the last island, the whole are altogether of volcanic, or else of coral and volcanic origin, and almost all have a wide fringing reef. Efáte contains two fair anchorages

in Havannah Harbour and Fila Harbour, while in Malekula is Port Sandwich, perhaps the best harbour for all weathers in the whole group. All of these islands are densely clothed in forest-trees and scrub—best described under the Australian name of "bush"—which is cleared in small patches by the natives for yams, bananas, &c.; and in the vicinity of the harbours above mentioned, by white traders who have there made quite extensive gardens for cultivating coffee, cocoanuts, and so on, which with every sort of tropical fruit flourish luxuriantly in the rich volcanic mould.

II. *Population, Causes of decrease, &c.*

The population is extremely mixed; many different types may be seen in any village on all of the islands, and of all shades of colour from black to light yellowish brown. The hair is tightly curled, and usually in large quantities, though not to the extent seen in Fiji, and the men are generally full bearded. It would, in fact, be hard to say which type mostly prevails, whether Malayan or Papuan; and the same applies to the languages. On the Shepherd islands only is there any perceptible difference, the natives here being of a far finer physique, lighter complexion, and higher intelligence than in Efáte for instance; and in pre-Christian days, though a good deal fewer in numbers, kept the adjoining islands in terror and subjection—like the Danes or Norsemen in our own country. This superiority may be due to the introduction of Samoan blood, concerning which is the following account in Mr. Macdonald's book "Oceania." At Mai (which is 8 or 10 miles from the Shepherd group), there arrived about forty years ago a canoe from Samoa, which must have travelled some 1,500 miles, and which contained eight half-starved people, who had sustained themselves during this long journey with a species of cheese made of compressed bread-fruit, and with cocoanuts. On landing, they were all killed and eaten with three unusually unappetizing exceptions, one of whom was living a few years ago. Mr. Macdonald has a piece of their canoe in his possession, which is represented as being a large and well-built boat.

In Efáte the population is rapidly dying out. About forty years ago this decimation began with kidnapping, followed by the "sandalwooders," who shot down the natives regardless—for there was none—of law. After this came the "labour traffic" to Queensland, which carried many off, never to return, having died of nostalgia, consumption, or the results of liquor and vice while in service. Now that these causes of decline are over, as far as Efáte is concerned, an extraordinary feature of the subsidence of the race is the fact that there has lately been

a marked disproportion in female births; nor can this be due to infanticide, the natives being all Christian.

M. Chevillard, a French settler of twelve years' standing, told me that a village near his place which he can once remember quite well with fifty or sixty souls, now contains only nineteen, of which but two are women. The peoples of the small islands to the northward, and especially of the Shepherd group, however, do not seem to be growing less: there was a downward tendency five or six years ago, yet this seems to have checked. In none of the islands, not even the heathen ones, such as Malekula, can the population be called thick. In this latter (along the coast at all events) the villages are collected in groups, and there is a long tract of seaboard with no villages at all, the result of bombardments by men-of-war—mostly French—which has caused the natives to club together or go to seek shelter farther back in the bush.

The seaboard natives of all the large islands speak of those who do not live by the sea as "man-bush." Whether these really belong to a different race it would be hard to say; it is just possible that they are the remnants of the aboriginal inhabitants who perhaps occupied the islands before the invading Malayan or Papuan stream. I had a long conversation one day with an exceedingly intelligent Malekulan, who told me that his tribe had once had a dispute with "man-bush," which was after some negotiations patched up, as the custom is, with the payment of pigs, and that he had accompanied the pig paying party. They went up into the hills by little known bush tracks, and finally arrived at the bush-men's village, which was not built like their own houses, and thatched, but consisted of circular pits in the ground, paved at the bottom and sides with stones, and with a few boughs thrown over the top. In this the family and dogs lived in such dirt that even my savage informant was disgusted, saying that "'e shtink plenty," not leaving the "house," he said, even to answer the calls of nature. They wore, however, the same costume, and had the same religious beliefs as himself, though not speaking the same language. He told me further that these people had no gardens or tame pigs, but spent their lives wandering about the bush living on wild yams, and catching wild pigs with their dogs, the men seldom being actually at home themselves, though the wives stayed there.

These bushmen are reputed to visit the sea-coast occasionally to make raids, kill and steal. It was the unprovoked murder of a woman of my informant's tribe when at work, during one of these raids, that had caused the dispute which occasioned the payment of pigs and visit to their boundaries. Two murders of

French subjects happened at Port Sandwich in Malekula while we were there, believed to have been committed by "man-bush," but as in all the islands he is the invariable scape-goat on a murder happening, we could not ascertain the truth of the charge.

III. *Traditions and History.*

The native tradition (according to the Efátese) is that the islands were fished up out of the sea by "Li maui tukituki," the goddess living in the moon, but I have heard none as to how the people came to live on them. This event is no doubt one of high antiquity, if we are to judge by the extreme diversities of dialect, which, all springing from the same root, must have taken many ages to be altered to their present conditions.

The legend in the Shepherd group is that five hundred years ago their islands were joined together and once formed part of the large adjoining island of Epi, from which they are now separated by a strait about three miles wide, but that a volcanic outburst occurred which broke them up into islands and annihilated the entire population with the exception of one man. He, it appears, had supplied himself with bread-fruit, and when the eruption began, hid himself in one of the village drums, which are huge hollowed out tree trunks stuck on end in the ground. When the disturbances ceased he came out, to discover that he was on a separate island, that everything was drowned in mud, and that everybody was dead except himself. Probably he then made his way to Efáte, as the next story is that an exploring party from that island arrived on the scene, and found but one plant growing on the new island, and from its name they called it Tongoa, and the next in size Tongariki, or little Tongoa.

Those who now live there are partly of Efátese extraction and speak a pure version of the present Efátese language, which like its speakers seems to have become much degraded; and there is a small colony of the same people living on the opposite shore of Epi, quite distinct from the real inhabitants of that island, who are said to be very fierce and savage, and always fighting amongst themselves.

Quiros, a Spanish discoverer, seems to have been the first white man to discover the group, he having landed on the island still known as "Santo" (from his name for it of "Australia del Espiritu Santo") in the sixteenth century; but little was known of it except its existence till Captain Cook visited and partly explored the main islands, landing on several of them. I was surveying on the island of Mau, a small extinct volcano lying to the N.E. of Efáte, when one of the natives volunteered to show me "Mark belong Captain Cook." On my asking what he

meant, he told me that Captain Cook (who named the island Hinchinbrook) had anchored there, landed, and cut some marks in a rock near the beach; also that he had conveyed some of the natives to Australia and brought them back again—this first instance of "labour traffic" I look upon as absolutely a fable; but for the rest I can only say that I was conducted along the beach to an opening in the bush in which, 50 yards from the shore, was a large rock of volcanic stone, with a rectangular face, and naturally smoothed. This rested on a natural wall of volcanic boulders, and at the lower edge of it were four curious marks evidently cut by some sharp implement, in the shape of algebraic brackets, and about 8 inches long. The right hand one was a good deal broken away, but the others were quite clear and sharp. The village tradition was very sound as to the fact that Captain Cook had cut these marks—"Ole fella man, he talk ole fella grandfader blong me,"—but the reason for making them did not appear. I can only conjecture that perhaps the latitude and longitude were painted within the two brackets.

During this century the islands have become better known; first during the rush for sandalwood, then for kidnapping the natives, and latterly by settled traders and "labour ships," until now, partly owing to commerical enterprise, and partly to the missionary subsidy, a small English, and a smaller French, steamer make a tour of the group once a month.

The group is not yet under any settled government or protectorate, as so many of the S. Pacific islands have been placed; but a joint commission of English and French naval officers sit at certain times of the year, and settle any disturbances between traders and natives which may have occurred since their last visit.

IV. *Clothing, Ornaments, &c.*

In the Christian islands, clothing consists of a cotton shirt and a loin cloth of decent length known by the Fijian (?) name of *lava-lava*, and often trousers and a hat, while the women wear a long shift from shoulders to feet over some sort of petticoat. I understand that in Eáte and the adjacent islands, even in pre-Christian days, a tolerably decent loin-cloth of matting or tappa was in vogue supported on a belt made of the matting like sheath of the cocoa-nut fronds, ornamented with a stitched pattern in dyed grass, and pinned with a sharpened bone from a fowl or other bird. This is still worn in Epi. The women wore a deeply fringed piece of matting which passed between the legs and was supported by a belt, so that the fringes fell over in front and behind—indeed I have specimens of this garment. In Tanna, however, and in Malekula (also, I believe, in Ambrym) any

attempt, in the male, in the direction of costume is directed towards the external genitals—usually very suggestive and disgusting. In both of these islands circumcision is customary, and as the clothing, such as it is, is connected with this practice as regards Tanna certainly, and probably with respect to Malekula, it will be convenient to give an account of it here. Mr. Grey, the missionary at Wea-Sisi, Tanna island, is my informant. Circumcision takes place usually at about the fifth year. The boy is shut up for a month at the time, and though he previously went quite naked, he afterwards adopts the costume of a full-grown man. Mr. Grey is one of the very few white men who has seen a Tanna man without his wrapper. The closest secrecy is adopted with regard to the penis, not at all from a sense of decency, but to avoid Narak (mentioned in my previous paper), the *sight* even of that of another man being considered most dangerous. The natives of this savage island, accordingly, wrap the penis round with many yards of calico and other like materials, winding and folding them until a preposterous bundle 18 inches or 2 feet long, and 2 inches or more in diameter is formed, which is then supported upward by means of a belt, and the extremity decorated with flowering grasses, &c. The testicles are left naked. A Tanna man returned from Queensland with a severe attack of syphilis, and after much suffering he decided to get medical relief from the missionary, he having some knowledge of medicine. Upon his wrappings being removed, Mr. Grey discovered that the so-called circumcision was effected by slitting the foreskin lengthwise at one place, and then rolling it back and allowing it to heal in a thick ridge, foul beyond words. This probably is similar to the method in Malekula, and would account for the ease with which the penis is there carried, also supported upward, but with much fewer means. Here there is only a sheath of banana leaf or fibre matting hanging from the waist-belt, into which the member is thrust, the testicles being left naked as in Tanna. A man who swam off to the ship one day, having disarranged his cloth in swimming, unfolded his outside wrapper on deck without any ado, and disclosed a second wrapper tightly tied behind the ridge caused by circumcision, thus concealing the glans, and offering a still larger means for upward support.

Neither in Tanna or Malekula is there any further body covering; but in the former island the hair is divided into innumerable little locks, each of which is "served over" with fibre threads, and resembles nothing so much as the ancient Egyptian royal wigs.

In Malekula three belts are worn. A narrow under one supports the penis and its wrapper, outside this is a broad strip

of nutmeg (?) bark about 6 inches wide (the investing of which is mentioned in my first paper), and a third which confines this broad bark belt, usually of plaited fibre, with long tassels for state occasions.

The women wear a narrow loin cloth, about 8 inches deep, which is adopted at an early age. It is worn beneath the buttocks, but is secured above the pubis by a belt passing round the waist. The end, to the length of a foot or more, is often in open-worked patterns of good design. In Santo the men are said to go quite naked, and I have a woman's dress from there which consists of a festoon of thirty or forty brown strings, on the lowest three of which white trade beads are threaded. It is secured at the back to a large billet of wood, of the shape of a fishing-lead, about 6 inches long and 4 inches greatest diameter, tapering to perforated points where the strings are secured.

Ornaments.—The hair is cultivated by the men with considerable care, but the women's is usually kept pretty close to the head: it is cleansed with lime, which gives it a yellowish appearance after use. Feathers, flowers, and combs are the almost invariable hair ornaments; sometimes all three together, and always one. The feathers may be a plain tuft of two or three, a huge plume of white cock's tail feathers a foot high, a crest made of the same, but yellow (somewhat like a North American Indian's), worn at "sing-sings," or a cone-shaped "pom pom" of clipped feathers secured on a cocoa-fibre basis.

Small wreaths of creepers are sometimes worn, while combs of bamboo or carved wood, occasionally tufted with feathers, and generally with a carved or incised pattern, are almost always used.

Beards and moustaches are customary, but after certain heathen ceremonies everybody engaged in them shaves. A man of Uripiv told me that on going on a visit to Ambrym (15 miles distant by canoe), he, with the rest of his party, were all shaved by the Ambrym people as being "new chums." The men of Uripiv were much astonished at our beardless condition; and on the first boat landing with two cleanshaven officers, and two ditto sailors, they went to the missionary and said they had never seen such a thing—the ship was manned by boys! Their own beards are never trimmed, and they vary greatly in length, some being quite creditable, while others are mere fringes.

Most of the men's ears are bored, and often have ear-rings of bent mangrove-root and a tuft of hair from a pig's back or tail in one or other, and sometimes, but not often, in both. A hibiscus flower is also occasionally inserted. The septum of the nose is often bored, but I cannot remember any instance of an

ornament being worn in it. Necklaces are rare; but in Meli, a Fijian colony near Eáte, the men wear a pearl shell trimmed round, or a large operculum ground flat: and I have occasionally seen the same elsewhere. In Malekula a couple of pig's tushes, or a collar of dogs' or fishes' teeth is sometimes worn round the neck, and almost all had a piece of broad white grass round the ankles as well as the neck. Women may also be seen, but rarely, with neck chains of small circular laminæ of sea shell and cocoanut shell, which I was told represented money, but that I think doubtful; or also numbers of shell armlets made by grinding down a large conical shell to a ring at its greatest diameter. The outside edge of this ring is often ornamented with lightly engraved dentated lines. Almost all the men wear an armlet of trade-beads of all sorts and sizes, usually blue and white, beautifully woven with fibre into elegant patterns. In Malekula the chiefs alone wear theirs on the right arm, the remainder on the left, but this distinction does not, I think, extend to the Christian islands. The tobacco pipe is usually stuck into the armlet, and the common leather pouch of Queensland station hands is worn on a leather belt for tobacco, money, and cartridges. Finger rings are much sought after by the women, and men may sometimes be seen wearing them, but they are always trade "jewels"—there are none of native manufacture.

Croton leaves, and those of a small lemon-scented flowering plant are in great demand for festive occasions, and are invariably stuck into the back of the belt, the sprays reaching sometimes as high as a man's neck. Flowers are also worn on ordinary occasions on the arms, stuck into the armlets.

V. *Painting and Tattooing.*

Painting.—In all the Christian islands painting of the body is prohibited; but in Malekula the men are almost always smeared with some colour. The favourite one is black, which is worn on the forehead, one man told me, to keep off sunstroke. I believe it is made from charcoal, and on festive occasions vermilion is also used; none of the colours seem to be laid on in any particular pattern, but just as fancy dictates. In Tanna the designs are most elaborate and hideous, but I had no time to examine them. At the "sing-sings" the women paint the entire of their face, and the whole of their infants, with bright orange turmeric or red lead; the former of which is imported to Malekula from Mai (now Christian) and elsewhere, where it was once extensively used, and is now in enormous demand among the heathen. Distemper paints, principally red lead, are a large article of trade with the "white men" in trading

boats, and will readily procure pigs, &c. The turmeric is shaped into small cones and is a very strong and lasting colour, not readily washing off. Widows and daughters when in mourning cover the whole of their heads, faces, necks, and shoulders with white lime, probably burnt from coral.

Tattooing.—Tattooing is not very common, the more usual method of ornamentation of this type being by cicatrices. I have never seen either on the face of a New Hebridean native, but I have seen it on the breasts and thighs of a few women in the Shepherd group—usually a series of dentated lines. Cicatrices may be seen on many men and women, oftenest on the breast, shoulder, and upper part of the arm, the herring-bone, elliptical punch marks, parallel incised lines and circular marks being the most common patterns, and at Uripiv I saw several men who had a "demits" or conventional diamond-shaped face surrounded by rays. I was there told that these cicatrices were made by the women, who first cut the pattern and afterwards remove the scab continually, until a permanent mark is obtained. I fancy this is done during youth.

VI. *Dwellings.*

In Efáte, and to the northward as far as Epi, including the Shepherd group, the dwellings are very rude, though strong in construction and resemble in appearance a badly made hayrick. The roof-tree is bent like a bow and is supported on several rough forked uprights. The rafters, also of bent boughs, are lashed to it, and brought down to the ground on both sides and ends, where they are spread out fanwise, and they are then pegged tightly down to the ground. Roughly trimmed boughs are now lashed over the rafters parallel to the roof tree, and over these a thick heavy thatch of reed grass is cast, which is often as much as 2 feet thick. An entrance is effected, crouching on hands and knees, in the middle of the long side; the rafters here instead of touching the ground are carried over a low ridge bar, seldom more than 3 feet high, over which the thatch hangs in a thick curtain. The entrance is almost always about twice as long as it is high. Inside all is black darkness, smell, and smoke. A fire is usually burning abreast of the entrance though no particular position is allotted to it. A very little of the smoke goes out by the door; most of it rises and blackens all the interior of the hut. The floor, except at the fire-place, is covered with mats of pandanus fibre, strong and lasting, and on these the household squat, and when night-time comes, sleep; the pillow being formed by a piece of stick resting on two short forks of wood driven into the ground.

The islands to which reference is now being made being now

entirely Christian, there are no "men's houses," but I have reason to believe that such existed formerly. The present house is accordingly divided by mat screens into "bed-rooms" at night time. Other furniture there is none, unless an occasional "trade bokis," the trophy of some returned labourer from Queensland, can be accounted as such, and the searcher for curios must hunt in the murky blackness of the rafters and thatch for spears, clubs, stone axes, arrows, and such articles, which have been slowly acquiring a thick coat of soot since they were dispensed with on the introduction of Christianity and civilisation. The houses were built in small villages of six or more, and in one lately heathen village I found a stockade, about 8 feet high, of cotton wood which surrounded each house and pig-and-fowl-run, and was entered over a pig-proof style. These villages appear to have been dotted about almost fortuitously in the bush, and seldom or never near running water or with other natural advantages; running water in fact appears to them as a most unpleasant and unnecessary adjunct to life; and it is curious to see how an almost naked man will tiptoe across a stream, holding up his loin cloth, if he has one, though the water does not come above his ankles. They are not afraid of the sea, however, though they bathe very seldom. In Eáte the missionaries are now persuading the inhabitants of the scattered houses —villages no longer—of the inland to collect in communities near the more healthy sea-shore, and have taught them to build quite tolerable huts of wattle dashed with lime, with walls, windows, neatly thatched roof, and clean coral-strewn paths leading about the village. There are no kitchen middens near the villages, as the pigs finish off all that is thrown away from the houses.

In Malekula, East Coast (heathen), a quite different type of house is built, of a much more civilised appearance. Externally it resembles a neatly thatched roof placed on the ground. I came upon some natives once building a house, and the process was as follows:—Two stout uprights, cut to the required height, with a natural fork in the head of each, were driven into the ground at the desired distance apart, and a ridge pole, well trimmed, and as straight as could be procured, was firmly lashed on the forks with pandanus fibre and strips of bamboo. Along the line where the roof was to touch the ground several small forked stumps were driven in, and two good straight poles were secured by lashings in them, one on each side of the house. Bamboos of the required length and of about 2 inches diameter were then taken and bent over the ridge pole; their ends, just touching the ground on each side, being lashed to the ground poles already mentioned. The wild bamboo of the islands is

of very thin shell compared with the Chinese variety, and is easily bent double, so that the joint passing over the ridge pole splits longitudinally on opposite ends of a diameter, and thus the bamboos lie quite flatly over it. When sufficient bamboos (at about 6 inches apart) have thus been laid, split laths also of bamboo are lashed transversely along them, and over these a neat thatch of plaited cocoanut fronds and pandanus leaves is secured.

The two gable ends of the house are now built in with lengths of bamboo lying touching one another, in two thicknesses ; the inner ones being perpendicular and the outside ones horizontal. A small square aperture occurs at one end for a door—only high enough to be crawled in at—and occasionally there is a square window at the other end : these are closed with pieces of board and matting at night, and during the midday siesta. The ordinary living-houses are small, measuring on the ground perhaps 7 feet by 14 feet : but the "men's houses," where the single men sleep *en masse*, are much larger, and the doorway is high enough to walk in at without stooping. The ground is usually quite uneven inside, and small mats of plaited cocoanut fronds are left lying about for sitting or sleeping upon. A stray pig or so may usually be found nuzzling in the dust of the men's houses, and dirt is universal.

At Port Sandwich, Malekula, there is a "tambu-house" on almost every dancing-ground where the articles used in the dances are kept, the "fish," "tambu-hats" (or masks), and so on ; also "demits," or ancestor effigies, such as would spoil if left outside in rainy weather. The "tambu-hats" above mentioned are made of banana leaves over a bamboo frame covered with clay and painted, and at Uripiv I saw one that had a very fair figure of a large sea-bird with pointed tail—like a boatswain-bird—on top of it ; and a mask painted in conventional colours hangs down in front to cover the face. At Port Sandwich I saw two gigantic bas-relief faces made of clay on a diamond-shaped wicker foundation, ludicrously grotesque and highly coloured, which, however, could not be bought, as the time for slaying of pigs on their behalf had not yet arrived. All these things are kept in a partitioned part of the house, and the rest of it is a dwelling place.

I never heard of, nor witnessed, any ceremonies on the construction of a house, but they may of course exist ; nor can I say if a dead man's house is burnt after his decease, but my impression is rather otherwise. The villages are irregularly built, and contain only a very few houses—five or six for instance—but several so-called villages, each with a different name, may occupy quite a small district with often not more

than a few hundred yards between them; each with its own "sing-sing" ground and distrust of its neighbour; with whom it is, as often as not, in a condition of feud. I never saw any built on piles into the sea, and as I mentioned before, water is rather avoided than otherwise.

VII. *Navigation, Canoes, Fishing, &c.*

The canoes of the islands we visited were all fitted with outriggers on one side. Those of Eáte are small, and will, as a rule, contain no more than five people, and that in smooth water; and in this island the original curiously-shaped matting sail has been entirely discarded in favour of trade calico, and European pattern.

In the outlying islands to the northward, and in Malekula, a far larger form, for open-sea passages, is found, together with the smaller ones.

Canoes are made of the trunk of the bread-fruit tree, partly burnt out, and partly hewn: they take a long time to make, and in the heathen islands the launching is accompanied by ceremonies of some sort.

The external shape is quite rough, the ends being just carelessly pointed off, and very few of them—I refer to the small smooth-water ones—follow a straight line between extremities, but are in every imaginable curve, and sometimes even in a double bend like an S. The upper part of the gunwale in the midship part of the canoe is tapered off to a thin edge, and holes are bored through it to which the four or five rough boughs—they are little better—which support the outrigger-float are lashed with a cross fibre (? cocoanut) lashing. The float, pointed at both ends, but otherwise as irregular as the canoe, of which it is about one-third of the length, is secured to these supports in the following way: short stout pieces of stick, pointed at one end, are driven into the midship line of the float, so that each pair forms a St. Andrew's cross. Two such crosses abreast support each outrigger pole in which it rests, and to which it is then tightly secured with fibre. As the whole safety of the canoe depends upon the outrigger, considerable care is, as may be imagined, exercised with this part of the construction. The outrigger poles generally extend out over the opposite gunwale as well, and a grating of cotton-wood or bamboo is lashed upon them on both sides of the canoe. Two paddlers sit upon these, and with one man at the bow, and a steersman aft, complete the crew.

The paddles are as roughly made as the canoe, the steering one being considerably larger than the others; there is no fulcrum used when rowing, but often for comfort of handling there is a T-head on the boom. The baler—a very important factor of

safety—is a large wooden scoop, like a French *sabot*, but rounded to the bottom of the canoe, with a handle coming, as it were, out of the back of the shoe, and extending about half-way across the opening. It is all cut out of one piece of wood.

The large sea-going canoes are built with much more care, and will hold twenty to thirty men. Their construction is as follows: A sort of keel, somewhat of the size, shape, and appearance (only with more regard to straightness) of an ordinary canoe, forms the foundation, and on it sides are built up of three or four planks—which, with only axe and knife for carpenters' tools, must give great trouble to cut out—each about a foot wide, which are lashed, or, more properly speaking, sewn together through small holes along their edges with tough fibre, caulked with the gum of some tree, and payed over with lime. The ends of the planks do not extend to the actual bow and stern of the canoe—which are formed by the keel foundation-log, sharply pointed off—but a heavy, thick board, broader at the top than at its base, where it fixes into the canoe, is planted athwartships at each end of the "hold," and the planks are stoutly sewn to it. The planks do not overlap at all, as in our boats, but as they follow the line of the end boards to which they are sewn, they form a sort of trough with spreading sides. The end boards extend a foot or so above the planking, and one of their uses is to keep out the surf when launching or hauling up the canoe.

The mast in all sizes of canoe is fitted in a rather curious and ingenious fashion. It is generally a stout, moderately straight piece of a bough, with a fork or "jaws" (as on a gaff or boom) at the foot, which rests on a stout transverse stick like a thwart, so that the mast does not touch the bottom of the canoe. It is supported on this thwart by fibre rope guys fore and aft, and the sail is hoisted on it, the halliards reeving through a hole burnt in the head. By this means the mast can be "stepped" at any part of the boat, there being several of these thwarts acting as strengtheners, and can also be inclined at any angle towards bow or stern, and lowered quickly in case of a squall.

In Malekula the system is somewhat different. The picturesque matting sail is here still in vogue, and is shaped like a sharply horned moon lying with points upward—at a distance it resembles a huge brown sea-bird. There is no mast, properly speaking, but each of the horns of the sail is supported on a longish pole (sometimes of bamboo), like a double lateen, the feet of which are lashed to form a cross. A fore and aft thwart is lashed to two of the transverse ones, and upon this the jaws thus formed ride; the whole concern of sail and spreaders being supported by guys, and can be drooped either on one side or the other as desired, or lowered quickly altogether.

Originally, and of course with a sail such as this, beating to windward was unknown (and even running before the wind in such clumsy craft is slow and even dangerous work, with the balers continually plying, and paddles working to prevent broaching-to); but with the introduction of the calico sprit-sail, an attempt is made to sail close to the wind—though I think beating is out of the question—generally with the outrigger to leeward, but I have seen it carried to windward by adventurous spirits in a light wind and smooth sea.

Decoration.—I never saw ornaments of any kind on the canoes of Eáte or Shepherd islands, but in Malekula the large ones have usually a carved conventional figure intended to represent a sea-bird's head and breast, painted green with black borders and white dots, lashed on to both ends. A long heavy tassel of fibre—I have seen very similar ones in Japanese junks—hangs from the bow, and with it in a long string, the jaws and tushes of several pigs—the relics, no doubt, of the launching ceremony. All down both of the outside edges of the sail long graceful fringes hang down, with extra large bunches at the two tips. The (heathen) natives are fond of travelling what must be considered as long distances—twenty to thirty miles—to pay visits to neighbouring friendly tribes on their own or another island. They frequently do not speak the languages of these tribes; but I fancy that "beach la mar English"—the *lingua franca* of these islands—is found sufficient; and also (as a man once told me) that they mutually understand one another, though they cannot speak each other's tongues. They sometimes remain away more than a month, probably dependent on the strength of the trade wind. The return of a canoe, or the arrival of friends from a distance, is signalized by the blowing of conches, which produce a strange bellowing sound, audible a long distance in still weather. The conches of Malekula are blown through a hole in the side of the spire; those of Eáte at the apex. I obtained in Nguna (off Eáte) a fine specimen, which has the point cut off to a depth of two or three inches, and a mouth-piece made of a young cocoanut is lashed and gummed on, which renders it much easier to blow. I understand that these conches are also used to call together members of a tribe for dances or ceremonies; but not, as far as I could make out, for war.

The outrigger canoe is in many ways very suitable to the work called for: it is exceedingly stable, much more so than an European boat of the same length; and indeed, so long as the lashings of the outriggers hold together, impossible to capsize. It may be hauled up or launched without staving on the roughest coral or boulder beaches, and—with experienced men—in surf

that would effectually swamp a white man's boat. However, it will soon fill when making a passage in anything of a rough sea, though still floating like a log ; and its slowness under paddles or sail, or both, is also very much against it.

VIII. *Fishing.*

None of the natives of the islands we visited, not even the civilised Christians, employ hook and line or net for fishing, but rely entirely on spearing or shooting with bow and arrow. These last operations take place when the tide is flooding on the reefs which fringe all these islands, and especially on moonlight nights. The highest tides, which cover the reef to the depth of about 3 feet, occur at night-time during spring, when, for the greater part of the night, crowds of men and boys bearing torches may be seen wading about and spearing fish. Fires are also lighted on the beach to attract the fish. The reefs, as a general rule, contain a number of natural basins, which, on the tide ebbing, are left with a depth of 6 or 8 inches in large flat pools. Where this does not occur the natives often make enclosures of rough stones with one small entrance ; which, though they will not of course retain the water, are useful for driving fish into at the proper height of tide, and thus offering a better chance for capture, through their not being able to find exit through the stones.

I never saw any very large takes, though there are plenty of fish. We used to catch a good many with hook and line from the ship, but caution must be observed with regard to them, as some species, which feed on the coral buds at certain times of the year, are extremely poisonous.

In Malekula I have seen the natives using a sort of net on a frame of the size and shape of a snow-shoe, with which small fish left behind in the reef-pools by the ebbing tide could be easily landed. Crayfish are evidently plentiful, as their shells are to be found in all directions on the reef-beaches ; but I never saw a native or anybody else catch one. Turtle are very common round the reefs, but are seldom caught. The heathen people will not eat the eggs—or at least, they would not at Uripiv (Malekula).

Swimming.—The New Hebrides natives are not fond of bathing, and though they can swim, are very rarely seen doing so. They swim on their sides, bringing one hand out of the water at each stroke. They are consequently not strong swimmers.

IX. *Weaving and Basketwork.*

The natives of some of the islands excel in weaving, or more properly plaiting floor mats, baskets, and (in old days) articles of

clothing, which become articles of trade with islands where this art is not practised. As far as I saw, they are altogether made by the women, and are constructed from the pandanus leaf, which is dried and cut in long shreds with a knife or piece of shell. The plaiting is done diagonally and generally with some slight pattern. Strips of all sizes are made up to 10 or 12 yards in length, and generally 2 or 3 feet wide. The better ones are finished off with a small open-work pattern at the ends, decorated with tufts of feathers, and down both sides the unwoven ends are left projecting as a fringe. They are excellent mats, stand an enormous amount of wear, and can easily be washed with soap and water when dirty.

Baskets are made of the same material and much in the same style: they resemble a square bag with two stout plaited cords forked into the sides, which, knotted together, form the handle. When the basket is full it is carried with this cord across the forehead, while the basket rests on the bent back. They are the best baskets I know of, as they combine lightness, durability, and strength to an exceptional degree.

Basket work is I think alone represented by the interweaving of cane grass to make garden fences or yam-vine supports. In the fencing, the weaving is carried rectangularly with twenty or thirty reeds to a "strand"; but in the other case, single reeds are stuck in the ground so as to slope diagonally, and are interwoven with another set sloping on the opposite diagonal.

The cocoanut palm leaf is very ingeniously woven in all the islands by plaiting together the long tongues of the frond, beginning at the rib, and joining the tips. A mouth is made by splitting the rib down the middle, and thus a very capacious basket, with a mouth fitting as tightly as a purse is quickly made. Pigs, yams, &c., for sale are usually carried in them. By splitting the rib down the middle first, and then plaiting each half of the leaf separately, a capital thatch foundation—a sort of vegetable tile—is constructed; this is largely used in Malekula, where they are also employed to form the ground covering of the inside of the hut.

X. *Pottery.*

The art of pottery, in the islands we visited, is now altogether lost; but as pieces of broken potsherds may be discovered in all directions, there is no doubt that it was understood in former days. In Santo they still make a rough red pottery, the pots being mostly of the shape of an Indian "*lota*," with a rounded base and generally a slight ornamentation near the rim. They appear to be moulded, not "thrown," but I cannot speak with any certainty on this point. On Eráte there is a legend to

account for the everywhere scattered pieces of broken pottery, which I quote from Mr. Macdonald's book "Oceania":—

"Li maui tukituki"—the primeval goddess who fished the islands up from the sea—"was carrying water home when the land had just risen (at the beginning) from the sea; the land was unstable and moving about, so she threw her water-jars down upon it, and knocked it into steadiness with the shock; but the water-jars were smashed to pieces, hence the fragments of pottery found all over the islands are called the 'buro,' or water-jars, of Li maui tukituki."

XI. *Stone Implements.*

In the Shepherd group, particularly on Tongariki, we found a few implements of the chisel nature, made of shell—probably the big clamshell found everywhere on the reefs. They are well shaped and finished, of a neolithic form, and the edges are only slightly dulled and chipped. In one village I procured three such implements mounted adze-wise in wooden handles; two being chisels and one shaped like a gouge. The back of each implement is finished in a point, and thus makes a sort of pick-axe when reversed in the handle. Besides these larger tools, there are small triangles of shell, one side sharpened like a chisel, but without handles, which are still in use for scraping up cocoanut when making a pudding, &c. The village at which I obtained the adzes had only recently become Christian, and it was suggested to me by a missionary that these implements might have been used for heathen festival purposes, and only sold now on their disuse. The natives were highly amused at my wanting them, seeing that I had good steel tomahawks of my own.

Circular discs of shell or opercula ground flat are worn as ornaments, and chains of tiny discs of shell with a hole bored in the centre—I cannot say by what means—are procurable almost anywhere also.

XII. *Fire.*

Contact with the white man has rendered the use of matches all but universal in the islands we visited. I never saw a fire otherwise produced. A man on Tongariki told me that he could make fire, though I could not persuade him to do so. He told me that on his island (Shepherd group) it was produced by rubbing one piece of stick backwards and forwards on another—as one sharpens a chisel—but that on the adjoining island of Mai, it was done by twisting a stick between the palms, the point of which rested in a hole in another piece of wood. Those who have been in Queensland often have a burning-glass with

which they light their pipes. The lighting of a fire occurs in one dance I witnessed, as described in my former paper, but it was done with a match; and I never saw any particular reverence paid to a fire.

XIII. *Food, drinks, &c.*

There are but few articles of daily food, and these altogether vegetarian. Yams (two or three varieties), bread-fruit, bananas (both indigenous and imported), and plantains with cocoanut, form the staples of diet. There are several kinds of nuts, all excellent eating, of which the almond or *ningai* is the commonest. One indigenous fruit which I have seen is known to white folk as the "Kanaka apple." It grows on a goodsized tree, and has a lovely feathery, bright lilac blossom which it sheds plentifully on the ground. The fruit soon follows, which at a little distance resembles a rather waxy, highly coloured, streaky apple. Its taste is inoffensive, but rather dry and uninteresting, with flesh like a loquat, and a large smooth stone in the middle. The betel nut palm grows everywhere, but the natives do not chew the nut as the Malays and other Easterns.

In the Christian islands the stock of food plants is increased by the taro, sugar cane, sweet potato, and papau or mammy apple. It may not be generally known that the leaves of this plant cooked in the pot with meat will render it much more tender than tropical meat generally is. Besides these, there are delicious oranges, pineapples and a large variety of the passion fruit, known as barbatine or grenadella, of the size of a vegetable marrow, which it exteriorly much resembles. A most palatable pudding is made by the natives by grating up yam or taro with cocoanut, blending the whole with the milk of a young green nut, and baking in the oven wrapped in leaves of "native cabbage," which is a small pink stemmed shrub with vine shaped leaves, and make a most excellent spinach when boiled. A fowl enclosed in this pudding and thus cooked, eaten with the pudding, makes as good a meal as a traveller in savage parts might ask for. The grating is performed either with a sharp piece of shell mounted on a heavy piece of wood, the cocoanut being scraped over the shell, or on the cross section of the stalk of a cocoanut frond, or else, as I saw in Malekula, upon a sieve made on a frame with fibre, the food being grated on the knots of the network.

For long journeys, a sort of cheese is compounded of bread-fruit, highly nutritious and compact, but evil smelling and of disgusting appearance. It is said to keep good for a long period of time, but I never had a chance nor indeed should I have been willing to test it. Otherwise fresh bread-fruit are roasted

on a small fire; and, the black burnt shell being removed, discloses the excellent floury interior with its sweet nuts. Besides the "native cabbage" spoken of above, we used (at the missionary's advice) to make spinach of "naika" and "nabisibisimata," the young shoots of a fig tree, and of the jalap plant respectively, and we found them by no means to be despised.

Meat diet.—Pigs are only eaten on festive occasions, and are not an every-day diet. Fowls are also very occasionally eaten, and, in the Christian islands, their eggs, which are apparently enjoyed, no matter how stale they may be. Flying foxes are considered as great dainties, and in the evening, when their flight begins, one may often hear the natives shooting at them with their old gas-pipe muskets. Goats are kept by the missionaries, and occasionally natives own them; but I think they seldom eat them, and only rarely use their milk.

Fish form a pretty constant article of food, and crabs both sea and land, with fresh water prawns, are also eaten The Shepherd islanders (Christian) eat shark greedily, but the Uripiv (heathen) people reject it, saying that a man dies from eating it. I have not heard of any worship being accorded to it however.

The natives do not understand the making of salt, but they will eat any given them, and I have seen natives eating breadfruit on the beach, dip it into the sea to get the salt flavour.

Cooking.—From Malekula to Eáte is entirely done in the well known earth oven, or by roasting, the food usually wrapped in wild banana leaves. The ovens contain hot stones, both beneath and above the article being cooked, and I have seen (in a Christian island, however), a sort of boiling or steaming produced by pouring water over the hot stones.

In Malekula, men and women cook their meals separately, and even at separate fires, and all female animals—sows, and even hens and eggs—are forbidden articles of diet. The natives will, however, eat white man's tinned meat and biscuit, regardless of whether it was cooked by a woman, or if it contains female meat, but I know of a native who explained that a mate of his had died in Queensland from partaking of sow, given him as a ration.

Meals.—There is only one regular meal in the day, namely, in the evening, just after sundown. Otherwise it is just a banana here, a cocoanut there, as hunger prompts. Just before sunset the women (in the heathen islands) come back from the fields bearing their loads of yams, &c., which are then portioned out and cooked.

Drinks.—I have never seen a native drink water (or indeed use it for any purpose). When thirsty, a young cocoanut is split,

and then with the head thrown back the whole of the milk is literally poured down the throat without so much as one gulp. The more civilised, however, are fond of tea, coffee, or cocoa, so long as there is plenty of sugar in them. Kava was made in Efáte and the Shepherd islands, but not, I believe, in Malekula. Its use is now discontinued, so I cannot say what the method of manufacture may have been. I never saw any other drinks; but the avoidance of the most obvious, fresh running water, which is in great abundance, and generally excellent, is very curious.

Utensils for cooking and eating are very few, cooking being done in the oven, and eating is generally off banana leaf, so there are only large oval wooden platters on which yams are grated or mashed; and, in islands using kava, kava-bowls of various forms, both generally slightly ornamented. Knives of hard wood, of several shapes and sizes, are met with for chopping and mashing yams, &c., but the fingers are always used for eating.

XIV. *Cannibalism.*

Until the introduction of Christianity ten or fifteen years ago, cannibalism was in full swing in Efáte and the adjoining islands to Mai and the Shepherd group. Mr. Macdonald, a missionary on Efáte, informed me that there was not a single middle-aged man on the island who had not at one time eaten human flesh, and that each village regarded the next simply as a larder for fresh meat. Of course this is all changed now, and they are so ashamed of this old habit that you can never get a man to confess that he has eaten part of another, though they will often acknowledge that their fathers before them "kaikai man plenty," so that it is impossible to get details about it, but the bodies seem to have been divided among such villages as were friendly. The missionaries intercepted and stopped one feast about twelve years ago, and saw the dismembered portions of a man lying in a canoe; one can only suppose therefore that no one ate very much at a time.

In Malekula we heard little, and saw nothing of cannibalism, yet I am convinced that it occurs, but more perhaps as a religious ceremony than to allay hunger. At Port Sandwich, a native solemnly assured one of our men that a young girl was to be killed and eaten after one of the dances; but I rather doubt that it really took place—the presence of a man-of-war would in any case have probably deterred them. A case which occurred in 1889 or 1890 was of a French half caste boy who was living with his (native) mother near Port Sandwich, and who being up in a cocoanut tree one day picking the nuts, was deliberately

shot at and killed by a native, and, we were told, was afterwards eaten. Upon the mother making complaint, a French man-of-war visited the village with fire and sword, so one must suppose that something of the sort really occurred.

Mr. Gillan, the missionary at Uripiv, told me that he knew of a vendetta between two villages which had been closed, not as is usual by the payment of pigs, but by the sending of a small boy as sacrifice; and who, he concluded, was afterwards eaten.

XV. *Music, and Musical Instruments.*

The natives of the islands we surveyed must be said to be fond of music. The Christian converts readily learn easy hymn tunes, which they delight in, and sing with wonderful correctness of tone, considering everything; but often with a curious disregard of either time, or the length of an individual note, confusing crochets with minims, so that it takes a little time to make out what tune is intended. They sing only in unison, but take great pleasure in hearing the "sing bokis" (harmonium) played, and were certainly much interested in our piano.

Their own songs are altogether of the "chanty" type, one man sings a verse of varying length, and the remainder then join with vigour in a sort of short chorus. To our ears there was always a tone of sadness—rendered grotesque by the style of the songs—in their singing, due no doubt to the untempered scale, and consequent inability to change the key, and there was also an inconsequence about the finish, in not coming on the key note.

When I was landed on Tongariki, eight or nine natives used to come up every evening, and take turns with our bluejackets in singing songs over the camp fire, so I had many opportunities of hearing their music. One man had a specially large selection of songs, and he it was when our boat was being hauled up out of the surf, who gave the words to which all replied with raucous melody, hauling together at the conclusion of the chorus. They may also often be heard singing interminable songs to themselves as they paddle about in their canoes, in which the civilised ear can detect neither time nor tune.

In Malekula, the only singing we heard was in connection with the religious ceremonies, and was accompanied by beating on the drums, or the flapping of the performers' feet, on the ground. For weeks after the big feast (the "Maki" spoken of in my former paper) a mournful howling would nightly ascend from the "sing-sing" ground, with desultory "whacks" on the drum. This howling usually took the form of a chant of about fifteen notes continually repeated, to which a second voice would keep in harmony at a constant interval of four and a half tones

(by our piano on board)—say from F to A flat below it—a most lugubrious sound.

When dancing, all sing the verse together in unison, changing from one foot to the other together, coming heaviest on the right, until at the end of the verse, the leading man would cry in falsetto "Hā" to which the others replied "Hă-Hă" with a stamp of one foot; then again "Hā-Hā," "Hă-Hă," and then altogether running down the scale "Huuu," and with envigoured speed a new verse began.

The men alone sing, so far as we heard; they have as a rule high baritone and tenor voices—if such uncouth voices can be given any particular timbre—slightly nasal, but on the whole both true and flexible. The range of voice seemed to me small, but that may have been from want of knowledge on their part how to produce it: they take up a given note with ease and accuracy; in fact, in church, the teacher generally begins each line by himself, and after the first two or three notes, the remainder join in without a fault, and the same applied, as far as one could judge, with their native songs.

Instruments.—The leading instrument is, I suppose, the universal hollow gong, which is made of hollowed out bread-fruit tree trunks of all sorts and sizes, and may be from 10 feet high and 2 feet diameter, stuck upright in the ground, to little ones 2 feet long and a few inches across, which lie on their side. There is a long slit down one side of the drum ornamented with circular holes, and a rude face is generally carved just above it. The big drums are thumped with a large billet of wood held transversely in both hands, and the little ones are beaten with two small drum sticks. Miles off on a still night their sonorous booming accompanied by the quick syncopated tattoo of the small boys squatting in front of the little drums, may be heard over the sea. As each drum gives a different note, the sound is not altogether unpleasant, and well matches the wild savage songs it accompanies.

The next commonest instrument is the syrinx, or Pandean pipes made of reed grass from Eáte to Epi, or small bamboo in Malekula. In the former the bottom of the reeds are closed, but in the other both ends are open; with both the sound is produced by whistling, as it were, into them, when they give a sweet, but very low note. The pipes seem to be arranged fortuitously—I have never seen two with the same collection of notes—and my belief is that each is made for the playing of one particular tune, and no more. The same applies also to the flutes, which are made of a single joint of bamboo, closed at both ends, with the blowing hole near one extremity and two finger holes on different diameters, stopped by the finger and thumb

at the other. One in my possession has some interesting designs burnt upon it (of which I have already spoken), and which may have had reference to the words of the simple tune produced by this particular instrument.

The conch shell must, I suppose, be reckoned as a musical instrument: it is principally used to herald the arrival of a canoe. The apex is cut off in some for the mouth, and in others the hole is cut into the shell at the side, and a weird bellowing note, which may be slightly altered by thrusting the closed fist into the mouth of the shell, is produced.

The natives are fond of jew's harps: one of them may usually be found in the trade box of a newly returned labourer from Queensland; so no doubt the ease of making the notes and their uncertainty when made, weigh with them in their desire for its music.

XVI. *War and Weapons.*

War among cowardly savages such as these, is carried forward on a very different principle to ours, as it is almost entirely conducted by means of individual ambuscade—a system which the narrow paths and dense bush of the islands not only encourages, but almost necessitates. In Efáte, when war was declared, certain paths were arranged to be "paths of peace," or neutral ground, and the remainder of the country was "dangerous." No fighting occurs in the Christian islands now, so the following remarks apply to heathenry, as seen in the island of Malekula:—

When there is war, the men of the villages implicated arm themselves and squat in the "sing-sing" ground until the boldest among them ventures forth, and hides behind a tree until one of the enemy passes close enough, when he "pots" him with a rifle or musket. The use of the older weapons has almost died out, with the exception of clubs and tomahawks, which are still in favour as being certain and noiseless. I met one old (so-called) hero on the now Christian island of Tongoa, who had established quite a reputation ten years before in a war with another village, by lying in wait outside houses, and on hearing a voice within, firing at it. He had thus killed three men and escaped scatheless.

When we were at Port Sandwich, a native, returned about two years from Queensland, and who from fast living and much liquor had become partly mad, ran "amuk" with his rifle, and severely wounded a young chief of a neighbouring village. War was declared, and the young chief's friends retaliated by lying in wait and killing a man of the madman's village. Reprisals of this nature would have desultorily proceeded for an indefinite

time if the missionary had not intervened and procured peace.

Another instance of the small things which keep up the eternal feuds between villages was the supposed bewitching (by the evil eye, I was told) by a man on a friendly visit to the above-mentioned madman's village, of a child who had recently fallen ill. He was laid wait for when returning home and shot dead at about 6 yards range. A war would most certainly have begun had it not been for the courage and energy of Pére Doncéré, the mediator on the former occasion, who managed to patch up the affair. Mr. Gillan, the missionary at Port Stanley (Uripiv island), told me of a fight, more or less *à outrance*, which occurred not long after his arrival in the place about three years ago. Two small islands form the entrance to the harbour, the northern one being Uripiv, the southern Uri, and they are not more than a quarter of a mile apart. Uri has a population of about fifty, while the other has from two to three hundred. There was war between them, and Uripiv manned all its canoes, and put over to Uri with its fighting men. They landed, and having cleared the village, driving young and old before them on to the fringing reef—it happened to be low tide—advanced upon them firing their rifles until the two "armies" were only about 30 yards apart, the fusillade being feebly replied to by the unhappy fifty of Uri. By the time Mr. Gillan had arrived on the scene, some minutes later (having been obliged to paddle himself over in his own canoe), all the powder was expended, and the fighting, in consequence, at a standstill. But instead of heaps of wounded being mutilated in savage fashion by the conquerors, or dead being carried off to be eaten, as he fully expected, he was astonished to find that no one on either side had been so much as grazed by a bullet, although firing at such close range! Peace was accordingly happily arranged, and the affair closed, to the huge relief, I have no doubt, of both parties.

Weapons.—The warlike weapons in use in all the islands we visited were limited to the club, spear, and bow and arrow, augmented in recent years by the "musket" and iron "tomahawk," or light axe.

The clubs are of many patterns, lengths, and weights. They are made of heavy casuarina wood, and in Eáte and the Shepherd islands average 3 feet 3 inches in length, while in Malekula they are only 2 feet 10 inches—making a considerable difference in size and weight. The former ones have almost always a large acorn as a handle and are carried by it, while the Malekulan club generally has a strong sennit sling, ornamented with tassels, and is carried hanging from the right shoulder. Perhaps the most effective patterns of club were the wooden "tomahawk,"

which has a double concave knife edge, or the Malekulan "slicer" —like a huge butter-knife; but these are almost now superseded by the European steel (or iron) axe-head, helved on a club handle. Many of the recent murders of white men have been silently committed by this weapon, which does not betray the murderer like the explosion of gunpowder. In Makura, a tiny island near the Shepherd group alone, it is said, in the New Hebrides, a small throwing club used to be in vogue, about 2 feet long, of an elongated pear shape, pointed at both ends.

Bows.—From Efáte to Epi, the bows are long—averaging 5 feet 8 inches—strong, clumsily made, and of inelegant curve; but a marked difference is observable with the Malekulan variety, the bows here being short, averaging no more than 5 feet, easily bent, carefully tapered to the points, and of singularly graceful shape. In both cases they are strung with some sort of fibre impregnated with a gummy material.

Arrows are very similar throughout: they range from 4 feet 6 inches to 3 feet, about 3 feet 6 inches being the usual length. The reed grass of which the shaft is formed is generally slightly burnt at the joints in order to harden them, and notched at the end, but not feathered. A bunch of feathers with tips outwards is sometimes found tied round the point of the arrow, either as a preservative to the point when not in use, or perhaps to keep it soaked with poison. The head of the arrow is usually a piece of hard dark wood, pointed at the end, which is stuck into the reed, and the splice served over outside with fine fibre while the other is hollowed out to receive the point of human bone, which is about 3 or 4 inches long, and very sharp. Much wordy warfare has raged over the question of poisoning; but I can only say that of the scores of arrows I have purchased in various parts, I never was sold any without the most extravagant precautions and warnings on the part of the original owner as to the danger of touching the points, though in many cases the arrows cannot have been in use for about ten years (since conversion to Christianity), so that no doubt remains in my own mind that in any case the intention of the arrows was to be poisoned; indeed, if unpoisoned, the wound they would give would be so slight as to be of small account.

A native once told me that the poison was produced from some plant in the bush, but he would not show me which it was. Probably the common method of impregnating the arrows in a putrefying body was also employed.

In Efáte and adjacent islands, arrows without human bone points were common—the hard wood being sharpened to a square point, and ornamented on the sides with scratched patterns. Nearly all were coloured near the point over the "service"

with turmeric, white, and occasionally blue and pale green. Another sort of arrow, much larger than the fighting arrow, and often beautifully carved, is used for shooting fish, for which a three-pronged one is also employed; and I have seen special arrows besides for shooting birds, or bringing down fruit or nuts with a flat wooden or iron head like a long cone, tapering back to the shaft, or sometimes with a long spiral sea-shell, the base of which is to strike the object aimed at. Arrows tipped with stout iron wire for fish-shooting are common enough now.

Spears.—The southern spears, that is to say from Efáte to Epi, are always, so far as I saw, made throughout in one piece of casuarina wood, which wood is chosen, being heavy, close-grained, hard, and generally growing pretty straight, besides which it takes a lovely deep red polish after the application of cocoanut oil. The head is carefully, and often beautifully carved to a length of about 2 feet 3 inches in all manner of designs, giving a series of gradually enlarging barbs. It was not poisoned, the idea being (as I was told) to pierce a man with it, and then break it off in his body. The balancing point is just behind the head, from which the shaft tapers off to a length of about 6 feet, making the whole spear of an average length of 8 feet 4 inches. No throwing stick is used to increase momentum, but I should think a good thrower would send a spear with fair accuracy 20 or 30 yards. In the island of Tongariki (Shepherd group) I obtained two rough-looking spears, of which the head was formed of an entire human shin-bone, sharpened off to a point, and was told that poison was placed in the centre of the bone, where the marrow had been. These were the only instances of poisoned spears I found in the southern islands. On this island also I found a large heavy piece of a clam-shell, 1 foot 4 inches long, slightly curved, smoothly polished, of ogee section, tapering to the ends, the greatest diameter being about 4½ inches. It is very heavy for its size, weighing about 10 lbs. I could get no satisfactory use for it—it was lying on the ground outside a hut—but my impression is that it is a throwing stone, such as is used in Tanna for felling and stunning an enemy, afterwards to be dispatched with a club.

In Malekula, the spears take a quite different form, as all that I ever saw, except one curious ornamental one which I procured, were shafted with bamboo, and though some had carved wooden heads on the same patterns as the southern ones, the generality had a light point of wood or human bone, decorated at the base with a highly conventional human face (demits), and a tuft of feathers, and were poisoned. Another fairly common variety ended in a flat head from which four or five long humanbone points protruded, of course poisoned. The heads of these spears

are generally "served over" in a chess-board pattern, diagonally placed, each square being differently coloured red, white or blue. Of course these spears are much lighter than the Efátese ones, and no doubt being also straighter and poisoned, did much more efficient work, and at greater distances. Their length is about the same as the others, namely, 8 feet 6 inches.

The conventional spear used in the dances was simply a longish bundle of reed grass, with the tips of the grass left in a bunch, the other end representing the "point." Another spear also used in the dances, actually employed for pricking the pigs to bring blood—and thus supposing them killed—was made like the ordinary weapon, but the head had a tapering hard wooden point 2 feet 6 inches long and without ornament, very sharp.

I never tested any natives at arrow shooting or spear throwing, but I have often seen them practising for amusement or exercise—especially small boys. The bow is held just off the perpendicular, and the string is drawn to the eye or just beyond it. A wooden bracelet is worn on the left wrist to prevent the string from striking that hand on release.

I should say that they were on the whole bad shots, at least they reach no high degree of accuracy such as one might expect. Their range is I should say certainly not more than 30 yards at the very outside, and they probably would not hit anything at that distance except by a fluke. They are more expert at shooting fish than anything else, and they use fair judgment when doing so, to allow for refraction.

XVII. *Cultivation.*

All the vegetables that are eaten are raised by cultivation, which is carried on in small irregular patches at all sorts of unexpected places in the bush. Those who have had the advantage of three years in Queensland are, naturally, the best gardeners, and generally bring back some implement—a spade or hoe—to work with, but the usual tool is simply a pointed stick, with which and a trade bush-knife the bush is cleared, and the rich soil scratched up sufficiently for their purposes.

Yams and taro require and receive the greatest attention; and in the heathen islands there is some sort of religious function at the time of yam-planting, which is also connected with the moon, but I can give no particulars.

There are several varieties of yam, some of which grow to enormous sizes, but the most palatable are the smaller snowy white or magenta tinted ones, which are excellent when properly roasted in the ashes. The wild yam, not much larger than a potato, is also very fair eating. It is brought into cultivation in Malekula, and is much improved thereby. Both sexes assist at the time

of clearing the ground and planting, new patches being opened up when possible every year; but after that, the bulk of the weeding, training the vines, and digging devolves (in the heathen parts) on the women.

After the seedling is planted, a small hillock of earth is raised over it, in the centre of which is a short stick, and round each hillock a trellis of reed grass is built (resembling those that we put round a flower-pot as ornament) of about 4 or 5 feet in diameter, and 6 to 7 feet high. As soon as the young vine appears it is secured to this trellis, and with astonishing rapidity it winds round and round until the whole frame is covered. Few more beautiful plants can be seen thus growing than the yam, with its elegant ivy-shaped leaves, delicately tinted in all shades from deep pink to pale and finally dark green, and clasped by countless tendrils to the framework.

The yams when brought home are (in Eáte) hung to branches of trees near the hut; but in Malekula, special "larders" of reed grass are built, raised about 4 feet from the ground, in order to keep the rats away from their contents.

The "*native cabbage*" before mentioned, is cultivated, though originally wild. It is an excellent anti-scorbutic, and has a pleasant fresh taste, like a rather sweet spinach.

The *papau* or *mammy apple* grows plentifully, and is known in the various island dialects as the "bread-fruit of the white-man," so it has evidently been imported. Several excellent varieties of *banana* and *plantain* have also been imported, the original native ones being small and harsh in flavour.

The *bamboo* is not cultivated, and though used for building and other purposes in Malekula as noted, many of its other uses are not taken advantage of. In one seaside village in Eáte, salt water for washing dishes, &c., was brought from the sea in lengths of bamboo in which the dividing joints had been pierced.

Arrowroot is found wild in the bush in Eáte, and its sale after preparation by the natives, has paid for the printing of the Bible in their own tongue, the erection of churches and school houses, and other beneficial works.

The native gardens are almost always fenced in with reed grass, which forms a very efficient barricade against wandering pigs, &c. Straight sticks from the cotton tree are also used, which soon throw down roots, and eventually spread into an impenetrable hedge.

Pigs, fowls, and dogs are said to have been brought into the islands within the last one hundred years, and Captain Cook has the credit of the introduction of the first two, but I cannot say with what amount of truth. It is noticeable that the same word

for dog, "kuri," is used almost throughout the group—one wonders if it can have any connection with our English word "cur."

No attention is paid to breeding, so that the pigs and fowls are as a rule small; the chief endeavour is to rear boars with as large and circular tushes as possible, and to this end they are tied by the hind leg to a post at a short tether so that they shall not be able to wear them down or break them. Many tushes can be obtained perfectly circular, and I possess one of which the point absolutely grows into the root of the tooth, while another one I have seen completes two and a quarter circles in a spiral, the curves closely touching all round.

Both pigs and fowls have gone wild in the bush, and in Eráte the descendants of domesticated cattle and dogs are found also wild. The wild fowls have become small and of bantam-like appearance, and are generally of a brownish colour with all-white tail feathers. They fly and run at a great speed, and are exceedingly difficult to shoot. Dogs are used for catching wild pigs, and there is generally a number of large hungry-looking curs of pariah appearance lurking round each village, ready to bark at, and frighten away an intruder; but a few well directed stones will generally keep them off until a native whom they know comes to one's assistance.

XVIII. *Burials.*

In Eráte and those parts, the natives, being Christian, bury their dead in the earth, and I understand that those who were not cannibalized in former days were likewise buried. I have never seen a funeral either there or in Malekula (where inhumation is also practised); but at Port Stanley in the latter island, I once saw two large heaps of stones near the beach, which a native told me were chiefs' graves. I never heard of either cremation, or burial at sea in a canoe.

With regard to Eráte in heathen times I quote the following from Mr. Macdonald's book "Oceania": "In Eráte the body was carefully prepared for burial, and dressed. The burial was accompanied with much solemnity, great wailing, and animals slain in sacrifice to the dead at the grave. It was supposed that the spirits, or essence of the animals slain, would accompany the souls of the deceased to the spirit world, the entrance to which was the westernmost point of Eráte, at a place called Tukituki."

I happened to land once on Meli island, just off the shore of Eráte, where a semi-Fijian colony is established, on the day on which their chief had died. The natives asked us to remain for the ceremonies, and presently on the blowing of a

conch shell horn we assembled with the whole of the natives round the hut of the late chief. He himself was apparently laid out inside as we could not see him, and in the front sat his three wives all covered with (I think) yellow ochre and dust, wailing loudly, while a huge fat pig lay dead outside the fence, the village dogs licking up its blood as it trickled forth. Presently everybody—and we also—laid their heads on their bent arms and began to wail; a mournful sound, not unlike keening in Ireland, and quite as perfunctory. After a time we were asked to go away, which we did, and so saw no more of the affairs.

We were asked to tell the people of Fila, off which island the ship was anchored, of the death of the chief (these people, though Christian, being the kinsmen of the Meli men), and that they (the Fila men) would give us something; however, I got no opportunity of doing so, so what the gift would have been I cannot say—one does not generally give a present to the bearer of bad tidings.

In Malekula, a sort of mummy is made, of which specimens were brought to the ship at Port Sandwich by a white trader, who had procured them in exchange for a rifle at the conclusion of a "sing-sing" in his neighbourhood. They are said to be the effigies of the chief whose skull (the only portion retained of all his remains) forms the head. This is plastered with mud to represent a living face, and body of bamboo, twigs, and mud, highly coloured in black, white, red, and purple stripes, forms the figure. All "mummies" seem to be decorated with a similar design; and I would suggest that they represent the body, as laid out for burial. A small one—perhaps personating a baby—has its head founded on a small cocoanut, and others have no body, but only a stick thrust into the hole where the spinal cord passes through.

On each shoulder, a highly conventional face is moulded looking to right and left respectively, and in each hand is a pig's lower jaw with tushes. Smaller highly conventional heads on sticks, with feathers stuck in where the ears should be, and ornamented with pigs' tushes, were also brought to us by the same trader, the "tambu" having been removed off them. We were given to understand that they were held in the hand while dancing.

XIX. *Boys' Games.*

The boys are not much given to playing at games, even when they have no school to go to; however, they may be generally seen practising shooting with small bows and arrows at any and everything, though none become anything remarkable as marksmen. Occasionally in the evening a sort of "touch-last" is

played on the beach, but the boys are shy of being questioned about themselves, and so it was almost impossible to find the rules of it.

On the beach at Tongariki, where there is no fringing reef, the boys had a sort of game which consisted in tying a stone to one end of a cotton-tree stick with strips of its own bark, and then all throwing their sticks together beyond the line of surf. The stones were so selected as to be only just heavy enough to keep the stick upright in the water, but not to sink it; and the last stick to remain bobbing about outside the breakers while the remainder had either lost their stones or were washed up on the beach, was the conqueror.

Diseases *in the* New Hebrides.

By D. McNabb, Surgeon R.N.

These are not very numerous and the opportunities for investigating them not of the best.

1. *Medical Diseases.*

(*a*) *Bronchitis*, both acute and chronic, have been observed in the islands of Eáte and Mai. The acute cases occurred in patients who had become Christians and had adopted European clothing. This they never changed, allowing their clothes to become wet and dry in accordance with the weather. In connection with this I have suggested to missionaries the advisability of giving these people as little to wear as is consistent with decency.

(*b*) *Pneumonia* has also been observed in Eáte, due to the same causes as Bronchitis.

(*c*) I have had one or two cases of *Dysentery* reported to me by white people, the cases having occurred among natives in their employ. Eáte.

(*d*) *Heart disease.*—I saw one man dying from this in Malekula. There was indefinite history of rheumatism, and there was both mitral and aortic disease.

(*e*) *Malaria.*—One does not come across many cases, as it is thought nothing of, but I have seen one case in Mai of splenic enlargement due to Malaria.

(*f*) *Hepatitis.*—Under this head I had better include one case of small liver abscess occurring in a native of Epi. I drew off pus with a trochar and cannula, and the man did well.

(*g*) *Eczema* frequently occurs affecting the head, particularly in children.

There is also an eruption frequently observed round the mouths of children which very closely resembles the eruption of Hereditary Syphilis. I am more inclined to think it Syphilitic as there is frequently seen the scarring which is said to be characteristic of this affection.

This eruption too is often communicated to the mammæ of the mothers.

(*h*) *Rickets.*—Cases of this disease are sometimes seen, and the malformations peculiar to Rickets have been seen in the natives of Efáté and Malekula.

(*i*) *Scrofula.*—This is a tolerably common affection as evidenced by the sloughing out of diseased glands.

(*j*) *Spastic Paraplegia.*—One case of this was met with in Mai. The history was rather hard to get. The probable cause was exposure to cold in Queensland, and the lesion was situated in the lower dorsal region. There had probably been pachymeningitis producing pressure on the cord. There was exaggerated knee-jerk, no loss of sensation, complete loss of movement, and spastic rigidity of both legs.

(*k*) *Leprosy.*—One case of this I saw in Efáte. The patient was a man of about 35. He stated that his wife's father, who lived with them, had died of a disease in which his toes "fell off." He himself had discoloured raised patches on the extensor surfaces of both arms and legs, also on the face, lips, and ears. All these situations were anæsthetic and hyperæmic only on the affected spots.

Elephantiasis.

(*l*) Elephantiasis is common in the islands, generally affecting the lower extremities—indeed one may almost say always—sometimes both, but, more usually, one. The foot and leg are the parts most commonly involved. There are many cases of true Elephantiasis, but there is also a spurious variety, which is, I am disposed to think, due to the thickening and interference with the circulation produced by ulcers which have healed. This I would call "*Pseudo-Elephantiasis.*" It resembles the other, but can be distinguished by the dense scars which are the evidence of old ulceration.

2. *Surgical Cases.*

(1) These people bear wounds very well, and their inherent reparative power is very good. They may cover a wound over with a rag or leaf, but have no way of setting fractures or dislocations. All wounds are allowed to heal by ulceration; there is no attempt to bring the edges of a wound together.

(2) Ulcers are extremely frequent. The majority arise from scratches or wounds inflicted in going through the bush. These wounds are uncared for, and the result is a spreading ulcer. Some of these ulcers are of enormous extent, reaching from the thigh right down to the foot. In many cases the bones are exposed and become carious, and the limbs are much contorted by cicatricial contraction. Beyond covering some of the smaller sores with leaves (especially those of a plant known as "Burru" or "native cabbage") no attempt to assist nature is made. Flies are allowed to settle on the sores and feast as long as their numbers do not exceed about fifty to the square inch. It is a common occurrence to see an ulcerated native, a cripple from his sores, spending his days sitting on the ground with his ulcers exposed to the air, and every now and then switching the flies off when they become too numerous. Possibly the fact of their feeding ground being such as it is may account for the ordinary fly leaving a nasty sting on a white person after settling on him. I have seen local œdema and ecchymosis follow the bites of these flies more than once, and am inclined to attribute it to the atmosphere of septic matter in which they live.

(3) *Cancer.*—One case of cancer of the rectum was observed in Epi. The disease invaded the floor of the bladder. I performed left lumbar colotomy, and afterwards heard the man was improved.

(4) *Hip-joint, &c.*—I have seen several cases of ankylosed hip-joint, evidently the result of old disease. Also one case of strumous disease of the ankle-joint.

(5) Talipes equino-varus is occasionally seen.

(6) In children the prepuce is almost invariably long, but is always removed just before puberty.

(7) Venereal disease is tolerably common amongst the natives of the New Hebrides, no doubt chiefly owing to the intercourse with white people who live in or pass through these islands.

These diseases are also imported by returned labourers from Queensland. I have not seen many cases of acquired syphilis.

ANNUAL GENERAL MEETING.

JANUARY 23RD, 1894.

PROF. A. MACALISTER, F.R.S., *in the Chair.*

The Minutes of the last Meeting were read and signed.

The CHAIRMAN declared the ballot open, and appointed Prof. THANE and Mr. RAY Scrutineers.

The Treasurer, Mr. A. L. LEWIS, read the following Report:—

TREASURER'S REPORT FOR 1893.

The income of the Institute for the year 1893 from subscriptions, publications, and interest, was £618 6*s.* 10*d.*, being £13 8*s.* 1*d.* more than was received from the same sources in 1892. This increase is entirely due to the fact that five members paid life compositions in 1893 as against two in 1892. The sales of publications were £43 14*s.* 5*d.* less than in 1892, chiefly because three numbers of the *Journal* only have come into the year's account instead of four numbers, as has usually been the case.

The expenditure for the year was £651 4*s.* 3*d.*, being £32 17*s.* 5*d.* more than the revenue, but £40 16*s.* 5*d.* less than the corresponding expenditure for 1892. This saving has mainly occurred in two items: firstly, £15 in the rent (which will, in 1894, become £30); and secondly, £54 11*s.* 3*d.* in the cost of the *Journal*, owing to three numbers only having come into the account instead of four. Lest it should be thought that the interests of the members have not been attended to in the matter of the *Journal*, I may mention that, notwithstanding this decrease, £25 more have been spent on the *Journal* in 1893 than in 1891, in which year four numbers were paid for. Stamps and parcels cost nearly £6 more, chiefly on account of the cost of sending out the Index, but this is balanced by a decrease of about £6 in the House Expenses, in consequence of fewer meetings being held. Printing and Stationery were also diminished to the extent of nearly £9, but Salaries and Commission were increased by about £39. This increase is accounted for, firstly, by a special grant of £10 10*s.* to Mr. Bloxam on account of his work on the Index—rather as a complimentary recognition than as an adequate payment—and secondly,

by the payment to him of three months' salary on his leaving the service of the Institute.

The liabilities at the end of 1893 (other than our moral liability to life members) were :—

	£	*s.*	*d.*
Rent for one quarter	33	15	0
Journal, say	100	0	0
"Anthropological Notes and Queries"	9	0	9
Miscellaneous Printing, say	9	0	0
Index	135	8	0
Sundries, say	7	16	3
Total	£295	0	0

The assets at the same date were £710 11*s.* 3*d.* Metropolitan Board of Works Stock (worth about £800), cash in hand and at the Bankers £31 13*s.* 7*d.*, some unpaid subscriptions, and the library, furniture, and stock of publications.

It is proposed to sell £110 11*s.* 3*d.* of the Metropolitan Board of Works Stock in order to pay for the Index,[1] but the other liabilities will be met by the ordinary income, and I hope that in future the reduction in our rent and a considerable reduction in the salary paid for office work will enable the Institute to keep its expenditure within its income, and that no further sale of Stock may be required.

A. L. Lewis,
Treasurer.

[1] This has now been done—March, 1894.

ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND.

Receipts and Payments for the Year 1893.

RECEIPTS.

	£	s.	d.	£	s.	d.
BALANCES, 1st January, 1893:						
Cash at Bank	53	9	5			
Cash in hand	12	17	5			
" " Petty	2	6	0			
" " Binding account	1	1	11			
	69	14	9			
Less "Notes and Queries" account	20	14	6			
				49	0	3
SUBSCRIPTIONS:						
For the year 1893	386	8	0			
Five Life Compositions	105	0	0			
Arrears	33	12	0			
In advance	6	6	0			
				531	6	0
SALE OF PUBLICATIONS:						
Messrs. Trübner & Co.	56	16	1			
Office Sales	4	13	6			
Binding Indexes	0	12	0			
				62	1	7
BOOKS, &c., SOLD FROM LIBRARY				6	10	0
DIVIDENDS for one year on Metropolitan Board of Works 3½ per cent. Stock (less Income Tax)				24	19	3
"ANTHROPOLOGICAL NOTES AND QUERIES":						
Balance as per last account	20	14	6			
Sales	2	17	9			
	23	12	3			
Less paid for binding and illustrations	14	11	6			
				9	0	9
				£682	17	10

PAYMENTS.

	£	s.	d.	£	s.	d.
RENT (including coal and gas), for one year to Michaelmas, 1893				150	0	0
PRINTING JOURNAL, Nos. 80-81 (double number) and 82 and 83 including illustrations and Authors' copies	191	9	5			
Less received from J. A. Brown, Esq., for illustrations to his paper	2	0	0			
				189	9	5
SALARIES AND COLLECTOR'S COMMISSION				204	6	0
STAMPS AND PARCELS				46	10	0
ADVERTISING				1	13	3
PRINTING AND STATIONERY				20	16	9
HOUSE EXPENSES:						
Cleaning rooms, &c.	17	13	6			
Attendance and Refreshments at Meetings	15	15	0			
				33	8	6
INSURANCE AND MISCELLANEOUS EXPENSES				5	0	4
BALANCES, 31st December, 1893:						
Cash at Bank (including Binding account £1 1*s.* 11*d.*)	28	4	7			
Cash in hand	0	7	6			
" " Petty	3	1	6			
				31	13	7
				£682	17	10

Examined and found correct,

EDWARD W. BRABROOK, } *Auditors.*
ROBT. B. HOLT.

The Secretary, Mr. CUTHBERT E. PEEK, read the following Report:—

REPORT OF THE COUNCIL OF THE ANTHROPOLOGICAL INSTITUTE OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1893.

During the past year eight Ordinary Meetings have been held in addition to the Annual Meeting.

In the course of the year the following numbers of the *Journal* have been issued: Nos. 82, 83, 84, and 85. These contain 459 pages of letterpress, and are illustrated by 21 plates.

The Index to the Publications of the Institute, including the publications of the Ethnological Society of London, the Anthropological Society of London, the London Anthropological Society, and the Anthropological Institute, covering the period 1843–91, has been prepared by Mr. Bloxam, and issued to Fellows, and the Council desire to express their satisfaction at the manner in which this volume has been compiled.

Twenty-one new Fellows have been elected during the year, viz., three honorary, and eighteen ordinary Fellows; twenty-eight have retired, been struck off by the Council, or died, also two honorary Fellows. The list of Corresponding Fellows has been revised, and fifty names removed in consequence, no replies having been received to a circular issued last year.

In the following table the present state of the Institute, with respect to the number of Fellows, is compared with its condition at the corresponding period of last year:—

	Honorary.	Corresponding.	Compounders.	Ordinary.	Total.
January 1st, 1893	46	75	84	231	436
Since elected ..	..	..	3	15	18
Deceased, retired, or struck off ..	2	50	3	25	80
January 1st, 1894	44	25	84	221	374

The following are the names of the Fellows whose deaths have been reported during the year:—

EDWARD W. BRABROOK, } *Auditors.*
ROBT. B. HOLT, }

Prof. Müller.
Prof. Schaaffhausen.—Honorary Fellows.
and, Rev. L. Bloomfield.
Prof. S. Cartwright.
The Earl of Derby.
Vicat Cole.
D. Mackintosh.
T. Ridgway.
R. Young.

The Reports were adopted on the motion of Dr. J. GARSON, seconded by Mr. HOLMES.

The PRESIDENT delivered the following Address :—

ANNIVERSARY ADDRESS.

By Prof. A. MACALISTER, M.D., F.R.S., *President.*

AMONG the other obligations which are imposed by inexorable custom upon your President at the beginning of the new year, not the least onerous is that of presenting before you, in the form of an annual address, a brief review of the progress of Anthropology in general, and of the work done by this Institute in particular, during the past year; together with a forecast of our scientific responsibilities in the year upon which we have newly entered.

An Institute to whose care is committed so large and varied a subject as that with which we are occupied, whose sphere it is to learn all that can be known of man in his multiform aspects, has a heavy responsibility, and needs to prosecute its work with an energy commensurate therewith, in all directions, in order to justify its existence. These yearly periods of retrospect are useful in this way, that they enable us to recognise our shortcomings, and so we are stirred up to increased activity in those portions of our subject in which we have hitherto made the least progress.

The year which now has closed has not been one of startling novelties, nor of epoch-making discoveries; but the records of our Meetings indicate that it has been one in which the sum of our knowledge has been augmented by patient observation, extending over the several sections of that great field which it is our special function to cultivate.

In Descriptive Anthropology we have had before us valuable papers: one on Damma Island and its inhabitants by Dr. Bassett-Smith; one on the natives of Borneo by Mr. Hose; and two on the natives of the New Hebrides by Lieutenant Somerville. Few papers of greater value have been during the year published elsewhere.

In Physical Anthropology we have had under our notice a careful, critical study of the crania of the natives of Australia by Mr. Duckworth, in which it was shown that the physical characters of the skulls of these peoples furnished some evidence in favour of the theory of the supposed dual origin of the inhabitants of that continent. Now that there are three active Universities, each with a Medical School attached, in the great cities of Australia, we look with expectation to these centres of culture for fresh light on the as yet unsolved problem of the origin of the Australians. Are they the sole survivors of an old and formerly much more widely diffused black race, modified in that region by their peculiar environments; or are they a mongrel people derived from the admixture of an intrusive race of immigrants with a negroid race of earlier colonists; and, if so, what was the nature of the second factor of the population? Was it a subdivision of the melanochroic race of western origin; and, if so, to which of the existing tribes of melanochroi were these allied? If this problem be capable of solution, it is only by the more systematic collation of larger series of observations than have hitherto been made, carried out by trained investigators devoting themselves to the elucidation of this difficult research on the spot, and on this account I would commend it to the attention of our antipodean anthropological colleagues.

We have also had from Mr. Duckworth an account of two crania of natives of the singularly interesting region of Nagyr, which were brought home and presented to our Cambridge Museum by Mr. W. M. Conway, the distinguished mountaineer and explorer. This is a contribution of much value to the ethnography of a little known people who inhabit one of the most interesting and inaccessible parts of the world. In connection with this subject it is much to be hoped that some of the anthropological information which has been collected by the researches of Dr. Robertson among these and the other peoples of the Siah Posh and other tribes in this region may speedily be accessible to those who are interested in the natural history of the races of man in this district, which has been considered by some to be near the cradle-land of the Aryan section of the human family.

I am happy to record in this connexion that the work done by Mr. Duckworth has been recognised by the college of which he is a member, who have elected him to a Fellowship mainly on account of the extraordinary zeal which he has shown in anthropological studies. It is to the credit of Jesus College, Cambridge, that it is the first college in any of our Universities which has in this manner shown its appreciation of the great group of sciences which deal with the Natural History of Man.

Other important contributions to Physical Anthropology have been published elsewhere during the year, one of the most valuable being the Researches on the Physical Anthropology of the Ainos by Professor Koganei of Tokio, published in the second volume of the "Transactions of the Medical Faculty of the Tokio University." I may also refer to the researches of the brothers Sarasin, recently published at Wiesbaden, on the equally interesting island folk, the Veddahs of Ceylon.

The Historical or Archæological side of our subject has also been brought under our notice. The valuable communication by Professor Boyd Dawkins on the relation of the palæolithic inhabitants of Western Europe to the neolithic is still fresh in

our memories; and Dr. Tylor has given us a singularly lucid study in the natural history of culture in his discussion of the relation between the grade of culture attained by the Tasmanians before their extinction, and that of our palæolithic predecessors in this country.

Those who were privileged to attend the recent meeting of the British Association at Nottingham will also remember the interesting paper which was read there by Professor Hildebrand on Anglo-Saxon remains and coeval relics from Scandinavia, by which a much-needed chapter has been added to the record of those peoples with which we in Great Britain are so closely connected. Other noteworthy papers on Historical Anthropology, especially connected with America, were presented to the International Congress of Archæology held during the year at the great Chicago Exhibition.

We have not had any contributions of mark on the subject of the Linguistic side of Anthropology, but elsewhere some progress has been made in this direction. I may specially refer to the vocabularies of some of the natives in the neighbourhood of Torres Straits which have been collected and published by our Member of Council, Professor Haddon. I may also chronicle as among the most useful of the papers published this year, the comprehensive surveys of the American languages brought before the Chicago Congress by Drs. Brinton and Boas. Contributions to Technological and Æsthetic Anthropology have been made to this Institute by Dr. Man on Nicobar pottery, by the Rev. John Mathew on the cave paintings of Australia, by Mr. Etheridge on Australian weapons and baskets; and other papers on cognate subjects have been published elsewhere, such as the discussion of the origin and development of early Christian art in Britain, by Mr. Romilly Allen—read at the Nottingham meeting of the British Association.

Lastly, to that most interesting of all branches of our subject, Psychological Anthropology, we have not been inattentive. Of its outcome in Folk-lore we have had before us the study of the strange custom of breaking vessels, as a part of the

funeral rite in modern Greece, by Professor Politis of Athens, and we have had several papers on African customs, by Mr. Lionel Decle. I may also call attention to the beautifully-illustrated monograph published during the year by our member, Professor Haddon, on the "Secular and Ceremonial Dances of the Torres Straits Islanders," and, while referring to this, may I add my sincere regret that our poverty, but not our will, has hitherto precluded our publication of papers of this nature requiring expensive plates. It is to be lamented that the author has found it necessary to allow this interesting paper to be published out of the country, and it is to the credit of the publishers of the International Archives of Ethnography that they have brought out this paper in so sumptuous a manner.

The proposal to amalgamate the two Societies which in this country are interested in these subjects, was under the consideration of our Council during the past year, but as yet we have not seen our way to consummate such a union. It may be that at no very distant date this amalgamation may be feasible on satisfactory lines, and it is earnestly to be hoped that by some such concentration the hands of all those interested in this department of Anthropology may be strengthened for the more zealous collection and more complete record of those surviving fragments of Folk-lore which the march of education and the consequent unification of the race are so rapidly annihilating.

This brief survey of our work shows that we have not been idle during the year 1893, nor unduly unmindful of any of those departments of our study for which we are responsible. I must not omit also to notice that the labours of the student in anthropological bibliography have been lightened by the publication of a carefully-prepared index of the volumes of papers published by this Institute and its predecessors, extending over the fifty years of their existence. Those who will in future have occasion to refer to this admirably-compiled volume will, I doubt not, feel themselves under a great debt to the labours of our late Assistant Secretary for the pains and

accuracy with which he has completed this task, and given us a Jubilee Memorial of British Anthropology.

But great as is the amount of research whose results are chronicled in this volume, or in the corresponding records of other Societies, we cannot but confess that it is small when we compare it with the vast extent of the unknown which stretches before us in every direction, and the outlook reminds us of those old maps of Australia with which I was familiar in my school-days, in which the great blank centre was only redeemed from utter bareness by the few spider-like lines which marked the tracks of some pioneer explorer. For the great harvest which lies before us the labourers are too few, and too often inadequately equipped.

It is the mission of every Anthropological Institute to endeavour to add to the sum of our knowledge in all directions, but there is for each some special work which is peculiarly its own, and which it can do more thoroughly than any of its sister Institutes.

One of the tasks which, it seems to me, is especially laid upon this Institute to accomplish is the making of an accurate, comprehensive, and exhaustive ethnographic survey of the population of the British Isles. We are not unmindful of the value of the researches which have been made hitherto in this field. The learned authors of the "Crania Britannica" have, with commendable industry, collected and given in an accessible form all that had been done by historians and observers before their time. Several British Association Committees have also added much to our knowledge of the characters of those elements which go to make up the population of our islands The indefatigable labours of Dr. Beddoe have contributed also, in an eminent degree, to advance our knowledge in this respect; but we are painfully conscious that there is still much to be done before we can definitely say that the last word has been spoken on the Ethnography of the British Isles. The work which remains to be done can only be properly accomplished by the making of an ethnographical survey of the United Kingdom

even more complete in its nature and scope than that contemplated by the recently appointed Committee of the British Association, and we cannot rest satisfied until some such Committee co-operating with this Institute has carried out effectually this most desirable project.

Such a survey can only be successfully made by the collective efforts of trained observers in all parts of these islands, and it should not be too much to hope that some plan may be speedily devised for the organisation of a collective investigation of this nature. There is no corner of the British Isles in which there are not people of sufficient education to realise the importance of this undertaking, and if these could be sufficiently interested in it to induce them to co-operate in the great work, we might have, accumulated by their united labours, a vast body of most valuable results. I would commend to the consideration of anthropologists the recently-published paper by Professor Haddon and Dr. Brown on the "Ethnology of the Aran Islands," as an example of the method in which the work of such a survey might be undertaken in each district.

In the year 1790 the distinguished Scottish economist and statistician, Sir John Sinclair of Ulbster, conceived the idea of undertaking a great national work of a somewhat similar kind in Scotland, namely, the collection of statistical information concerning every parish in that kingdom.

For that purpose, he sent to every parish minister in Scotland a number of queries, the answers to which, when digested, constitute that marvellous body of facts contained in the Statistical Survey of Scotland. To ensure accuracy, and to awaken interest, he enlisted a number of what I may call statistical missionaries, who, each in the district assigned to him, overlooked the collection of the results. Perhaps I am unreasonably sanguine, but it seems to me not impracticable to organise some similar method for the purpose of a great collective ethnographic survey. If we could only enlist in the cause the great army of the educated classes, the parochial and other clergy, the practitioners of medicine, the board

school masters, and others of similar position, education, and intelligence throughout the length and breadth of the land, we might accomplish by their aid such a survey as would be a real ethnographic census. If a large and enthusiastic central committee could be organised, among whom the land could be divided into provinces, for each of which one or two would be responsible, and if these would take steps to procure the filling of such schedules as that which the British Association Committee has drawn up, we might be able, with such a machinery, to obtain a body of facts of lasting utility.

The time for doing such a work effectually and satisfactorily is passing. Each year this kind of information is becoming more difficult of collection owing to the growing facilities of migration, and to the increasing depression of those rural industries on which our village populations are dependent.

The mass of information thus accumulated would give us material that would aid us in answering a round dozen of the most important questions which have long vexed the souls of historians and anthropologists, and which isolated observers have been hitherto labouring to answer with only a limited degree of success. Of such questions the following are samples:—Have we surviving in our midst any representatives of the pre-Celtic inhabitants of our islands, and, if so, are such people of a pre-Aryan stock, and are they of the same type as the long-headed people whose remains we find in the long barrows? Are their affinities with such pre-Aryan races as survive in other parts of Europe, Basque, Ligurian, Finn, or Ugrian? Are these the Silures whose *colorati vultus et torti plerumque crines* were noted by Tacitus, and what element do they form in our present population in different localities? Were the Celtic immigrants a homogeneous people, or had we several successive waves of intrusive Celtic-speaking races of different characters, and, if so, what were their affinities? What relation subsisted between the Cymric and Gaidheilic-speaking peoples, and if they were separate waves, what was the order of

superposition of these strata of population? How far did Roman supremacy introduce new elements of population, and how far were these permanent? To what extent, at the present day, do people of Celtic ancestry pervade the different parts of the island, and what are their affinities, Cymric, Gaidheilic, or Arvernian? How far were the Saxon invaders homogeneous, and can the several elements of these hordes and their descendants—Frisians, Angles, Saxons, and Jutes—be discriminated among the existing people, and, if so, by what characters? What amount of Danish and Scandinavian admixture took place in later times, of what nature were these intrusive peoples, and how related to their Saxon predecessors? How far do other elements enter into our population?

These are a few specimens of the queries which we desire to solve. On the solution of such problems individual workers have expended much toil and much ingenuity, and in their answers they have too often shown a little prejudice, and, it must be confessed, an abundance of fancy. But it is reasonable to expect that some of these would be, if not completely solved, at least so far elucidated by such a survey, that our British ethnography would no longer present the involved and dispiriting aspect which it now displays.

We know much of the histories of the several races which have contributed to make up our population, but we are perplexed as to the relegation of individual existing types to their parent races. A visitor to our weekly market at Cambridge cannot but see that the assembled crowd of buyers and sellers do not form a homogeneous people. We see, as the representative of a common type, the slight, middle-sized man, with narrow forehead, moderately long head, fair or light brownish hair, straight, prominent, high-bridged nose, starting from below a slight fronto-nasal notch, on each side of which the eye appears depressed under straight and somewhat projecting brows. The narrow face ends in a narrow, weak chin, and the moderately small jaws are flanked by cheeks which are not very prominent, and seldom ruddy. Mixed with such is the

taller, burlier figure of the square-faced, broad-headed, often fair-haired man, with broad brow, more prominent cheek-bones, massive chin, broader nose, often projecting at the tip. Mingling with these are at least three other types, and many which represent intermediate characters. We ask ourselves what races do these types respectively represent, and from what parentage have they come? but hitherto we have asked without obtaining any satisfactory answer.

The labourers in such a survey would require to take account, not only of the present, but the past—the ancient monuments in each district, and especially all collections of the remains of humanity in each place; and such aids are abundantly to be found. In our own neighbourhood at Cambridge we have been fortunate in finding several series of relics of the past inhabitants. Within four miles from the town there has recently been brought to light, by the process of the removal of the soil over an extensive area in the process of coprolite digging, a large collection of the remains of man and of his works. From this one place, close to the village of Hauxton, at a bend in the upper portion of the Granta, I have obtained over a hundred skulls, and these are especially interesting, as they form a remarkably homogeneous series. They are mostly small, mostly dolichocephalic, weak-jawed, flattened at each side behind the mastoid process, so that the occipital region projects narrow and protuberantly over the feeble nuchal crests. The parietal eminences bulge so that the norma verticalis presents a somewhat elongated oval or coffin-shaped outline. The orbits have a low index, but the brow ridges are seldom pronounced, and the prominent nasal bones overhang a rather narrow pyriform aperture.

With these crania there are found implements of bronze or iron, few warlike weapons, so that it is no battlefield; only one or two battleaxes, and one or two iron spears; but there are many knives of the peculiarly truncated shape which is commonly called Saxon, adzes, implements of husbandry and domestic use, wheel-made pottery of rough construction, and

rough clay vessels, but no cinerary urns. The bodies were disposed irregularly, not oriented, and are found at depths which vary from one to five feet from the surface. In the circumjacent soil I have picked up coins of the later Roman emperors, of Burgred and Aelfred.

Who were these? Evidently pre-Christian, or at least non-Christian from their mode of sepulture; but in many particulars they differed from that series of Anglian remains which I assisted Baron von Hügel in exhuming from a pre-Christian cemetery not four hundred yards from my house in Cambridge, in which many folk had been buried, with many an ornament of characteristic workmanship. Of these latter a splendid series is deposited in our University Archæological Museum. Both differed from our last find of nine superposed skeletons which Professor Hughes and my son disinterred from an ancient pit in the chalk at Fulbourn, where they lay irregularly disposed on a stratum of broken Roman pottery. In these three series we have the remains of closely allied but not identical peoples, all differing from the large-jawed and coarsely ridged crania found with Roman pottery at Girton, and equally differing from the broad-headed remains of later date which have obtained from Barnwell and Kingston in our county. Truly there is yet much to be done in the identification and classification of these peoples.

When the Ordnance Survey was in progress in Ireland, the then Under Secretary, Sir Thomas Larcom, employed an able and accomplished Irish scholar, Dr. John O'Donovan, to visit each district which was being surveyed, to examine, as far as he could, the ancient monuments, to converse with the inhabitants, and to gather the traditions of each place. These he committed to writing, and he dispatched to Dublin Castle periodically a series of letters embodying the results of his researches. The bound volumes of these, which are preserved in the Library of the Royal Irish Academy, are classified as to counties, and they form a unique and priceless storehouse of topographical information. I would commend some such adjunct as this to the organisers of such a survey as that which I have sketched.

I have little doubt that were a survey of this nature made it would dispel many cherished delusions, and that its results would not accord with some of the common views currently held concerning our population. Our newspapers and popular periodical literature abound in allusions to the beliefs of a generally accepted ethnography which would scarcely stand the clear light of such a systematic investigation. In a recent number of a leading magazine an able writer attributed some of those difficulties of which most of us have heard as existing in connection with the government of Ireland as the results of the attempt to impose Teutonic institutions on a Celtic people. It is more than probable that our survey would show that the Celtic element is as strong in the counties of Down and Antrim, in which such troubles are least, as in those of Tipperary or Queen's County, and in neither pair stronger than in Cumberland, Devon, or Wigton.

I have spent so much time in discussing this one of many tasks which lie to our hand, that I must pass over many others to which, had your patience permitted, I should have wished to advert. The whole subject of anthropometry, so long treated on empirical lines by the schools of France, Germany, and Britain, requires to be reorganised on a true physiological basis; but as I had recently occasion to express my views on this subject, I shall not at present refer to it any further, but will only say that this can only be done by the study of the human cranium and skeleton in connection with the soft parts which cover or lie within the cavities of the bony frame. It is the advantage of having a large Anatomical School in Cambridge which gives us particular facilities for investigation in this department, and I hope soon to be in a position to formulate some definite results of our work in this matter. Every cranial and facial measurement should have some definite object, and much careful consideration is needed to determine the relative values of each of these. The introduction of anthropology as an integral part of anatomy as a subject for study in the Natural Sciences Tripos course of our University

has given a stimulus to its pursuit on the part of our younger men, and the fact that every year at least a score of men leave our school who have been trained to use their hands and eyes in practical anthropometry must produce some effect in diffusing an intelligent interest in the subject. The growth, too, of our Cranial Collection, which now contains over 2,000 specimens, gives us an amount of material for teaching which is not surpassed by any Museum connected with a teaching institution in the country. We have also the advantage in Cambridge of having the collaboration in our Anthropological School of men of experience, like Mr. Hickson, Professor Haddon, and Baron von Hügel, who are acquainted with savage men and their ways, as well as with those of our Western European races, and who can thus give a living interest to their teaching of the subject.

There is another branch of physical anthropology, as yet in its infancy, to which I would desire to refer, and in which I hope soon to see some results brought before us. I refer to the physical basis of phonetics. A former president of the Anthropological Section of the British Association, when discussing a cognate subject of which he is recognised as a master, epigrammatically stated that it was as absurd to speak of an Aryan skull as it would be to say that a tribe spoke a brachycephalic language. Perhaps so! but brachycephalism, or at least brachygnathism, must have a physical effect in linguistic expression. It is a matter of much difficulty to obtain the material for this investigation, but in comparing the arrangement of the muscular fibres of the few tongues of black races which I have been able to obtain I have been struck with the fact that there is a certain difference in the disposition, attachment, and number of the respective bundles of fibres of the intrinsic muscles as compared with the tongues of the British. When we note in addition that there are certain racial differences in the shape of the palatine vault of the alveolar arches, of the palatine folds, we cannot but believe that these also must exercise a marked effect in the relative facility with which different races can enunciate certain specific sounds. My

friend and former demonstrator, Mr. Eichholz, now Fellow of Emmanuel College, Cambridge, has in a short preliminary memoir communicated to the Anatomical Society, pointed out the racial differences observed in the alveolar arch. I am hopeful that I may be able to enlist other workers in the arduous task of research in this department, for I believe that there will thereby be much light thrown on some of the curious points with which the phonologist is familiar—why certain races nasalise so many sounds; why some in cannot easily pronounce *l*—others find the same difficulty pronouncing *r*; why sibilants are absent in some languages; why clicks are present in others. All these are physical phenomena which require to be studied from the anatomical side far more thoroughly than they have hitherto been.

There are other physical problems to which I would have alluded did time permit. The large field of study as to the cause and distribution of pigmentation and pilation, to which our Member of Council, Professor Thomson of Oxford, has devoted much time and study, is a subject of great interest, and one concerning which I hope he will give the Members of the Institute some account of the results at which he has arrived. Then there are the general questions of the origin of race characters so closely bound up with the much-vexed general problem of the hereditary transmission of acquired characters. Upon this subject I would call your attention to an interesting paper by Dr. Havelock Charles, upon the conformation of the astragalus in the natives of the Punjaub, which is associated with their habit of resting in a squatting posture. That these are not individually acquired characters Dr. Charles has been able to prove, and in a forthcoming paper in the "Journal of Anatomy" he has promised to give the record of some more extended researches, and to describe specimens which show that these additional facets exist not only in the adult but in the child, and even in the fœtus before birth. This opens up an extensive and interesting subject. That this attitude is a primitive one is probable; and that the acquired

characters are not the new facets but the circumscribed anterior articular areas present on the astragalus in the Western and civilised races is equally probable. We know that the art of the shoemaker has induced certain modifications of structure in the anatomy of the lower limbs of the higher races; it will be interesting to follow this new line of research, and to note these phenomena as examples of the changes which the art of the joiner has imposed on the human frame.

There is also a fertile department of this study of race characters opened for us in connexion with the study of the development of new characteristics in migrated races, such as those which are producing in America and Australia the modifications of form and feature which are recognisable as distinctive of the second and third generations of the new peoples of these continents. Connected with this is the examination of the changes which have taken place in the descendants of the black races of Africa, which form such an important factor in the population of the Southern States of America, a problem for light on which we have hitherto looked in vain to the active and prolific School of Anthropology in the New World. These are but samples of the enquiries yet awaiting study on the part of the investigator, and many other lines of research of equal importance will readily occur to the thoughtful anthropologist.

I have left myself no time to speak of the ethical and metaphysical sides of the subject, which are probably the most important with which the Philosophical Anthropologist can be occupied, and here there is an equal, or perhaps greater amount of work to be done. Our sister Society, whose special function it is to collect the Folk-lore of this and other peoples, has done much to preserve and collate the broken fragments of forgotten cults. We are the descendants of many races, and there are still in our midst memories of lines of thought whose origins stretch back into the abysses of antiquity. Every such relic of fossil human thought and superstition is worthy of careful record and analysis. How little do we know of the

pre-Christian religions of our forefathers, and of the mythologies which were to them articles of faith? Among the great families of the Celtic-speaking peoples from which many of us draw our blood there are surviving fragments of our ancestral beliefs embedded in our language, our traditions, and our habits, which are of incalculable value from the historic point of view. From these we learn that there was an individuality of cultus among the Gaidheilic Celts in many respects differentiated from that which prevailed among the Cymric Celtic-speaking peoples, and both these were distinct from the new phases of religious thought imported by the Teutonic tribes of the great Saxon invasion. It belongs to our province to classify and preserve these, that we may thereby be enabled to reconstruct the life-histories of the races now so inextricably blended in our populations.

Another branch of Ethical Anthropology which claims our attention is the practical subject of the Anthropology of crime, for the study of which we are so largely indebted to the Italian school of anthropologists, and especially to Professor Lombroso and his pupils, and I am glad to find that this study has been lately taken up by many of the distinguished alienists in this country from whom we hope for fresh work in this direction. And while referring to this there is another practical side of our subject which is of great importance in our criminal jurisprudence. I refer to the anatomical methods of individual identification, a research with which we naturally associate the names of Francis Galton and Jacques Bertillon, on which also we may reasonably expect additional information from these and other observers.

Our Institute has this peculiar privilege that it is the parent Anthropological Institute of the English-speaking people—that people whose representatives are to be found in all parts of the habitable globe. Would that our resources were commensurate with our opportunities. We have in the past felt the pinch of the *res angusta domi*; our membership is not a tithe of what it should be, and includes few of those who

can help us by liberal pecuniary aid; but in spite of our poverty I know of no society which has with straitened means done so much to extend our knowledge of mankind. Although we are doing a truly national work we ask no Government subsidy. We keep up an economical establishment, and are desirous of spending on our publications all that we can obtain. A suggestion has been made which is likely to be acted on; that in our office a list should be kept of those of our Members who have special knowledge of special tribes and particular populations of different parts of the world. When this is done it will be an effectual means of aiding those who purpose visiting any outlying or distant countries, in obtaining the preliminary knowledge which will enable them, with the best advantage, to deal with the races that inhabit these lands. From our shores there are daily going many whose future will lie in commerce with, or in ruling over, or in teaching peoples the most diverse; and surely it would be of enormous importance to these if in a central Institute like ours such knowledge as is possessed by our membership could be made available for Imperial purposes. In doing this we would be fulfilling a national want, and contributing in a real manner to the consolidation of the Empire.

Surely this is reason enough to induce all those interested in such a consummation to join us. We have all the machinery of this work ready to hand. The Institute possesses a valuable library, which we are endeavouring to make as perfect and as accessible as possible. We include in our membership a body of men who could easily, without extraneous help, write an encyclopædia of cosmopolitan anthropology, and if our membership could be enlarged in a degree proportional to the importance of our subject, if our wealthier classes could be but induced to interest themselves in our pursuits so as to help us to the more prompt and extensive publication and illustration of the results of anthropological researches, there would be before this Institute a brilliant and increasingly useful future: and it is the object of our fondest aspirations that this anticipation may be realised.

It was moved by Sir WILLIAM FLOWER, seconded by Sir HUGH LOW, and unanimously resolved—

> "That the thanks of the Meeting be given to the President for his Address, and that it be printed in the *Journal* of the Institute."

The SCRUTINEERS gave in their Report, and the following gentlemen were declared to be duly elected to serve as Officers and Council for the year 1894.

President.—Prof. A. Macalister, M.D., F.R.S.

Vice-Presidents.—J. G. Garson, Esq., M.D.; C. H. Read, Esq. F.S.A.; R. Biddulph Martin, Esq., M.P.

Secretary.—Cuthbert E. Peek, Esq., M.A., F.S.A.

Treasurer.—A. L. Lewis, Esq., F.C.A.

Council.—G. M. Atkinson, Esq.; H. Balfour, Esq., M.A.; E. W. Brabrook, Esq., F.S.A.; Hyde Clarke, Esq.; J. F. Collingwood, Esq., F.G.S.; Prof. D. J. Cunningham, M.D., F.R.S.; W. L. Distant, Esq.; A. J. Evans, Esq., M.A., F.S.A.; Prof. A. C. Haddon, M.A.; T. V. Holmes, Esq., F.G.S.; Sir Hugh Low, G.C.M.G.; J. Edge-Partington, Esq.; F. G. H. Price, Esq., F.S.A.; R. H. Pye, Esq.; F. W. Rudler, Esq., F.G.S.; H. Seebohm, Esq., F.Z.S.; Oldfield Thomas, Esq., F.Z.S.; Prof. Arthur Thomson, M.A.; Coutts Trotter, Esq., F.G.S.; M. J. Walhouse, Esq.

A vote of thanks to the retiring Vice-President, the retiring Councillors, the Secretary, the Treasurer, the Auditors, and the Scrutineers, was moved, seconded, and carried by acclamation.

ANTHROPOLOGICAL MISCELLANEA AND NEW BOOKS.

Blood Parasites, with directions for preparing slides of dried blood.

Recent observation has demonstrated that the blood of man—particularly in tropical and sub-tropical countries—may be inhabited by microscopic nematoid worms, the progeny of larger mature filariæ lodged in different parts of the body. It has been further observed that at least one species of these microscopic blood-worms has a wide geographical range, whereas the others seem to be confined to comparatively limited areas. It has also been established that these filariæ give rise to grave diseases—elephantiasis, chyluria, sleeping sickness, &c. Although nothing like a systematic examination of the blood of the inhabitants of different countries and districts has been made, it has already been ascertained that there are at least four species of these interesting and important parasites, the *filaria sanguinis hominis nocturna*, *filaria s. h. diurna*, *filaria s. h. perstans*, and an as yet undescribed and un-named West Indian species. Probably, therefore, extended and systematic observation would add several new species, besides acquainting us with the exact geographical distribution and pathological import of the four already known. It would be well to point out to intending observers that each of the species hitherto studied has peculiarities of habit special more or less to itself, as regards the times of its appearance in the general circulation. The *filaria nocturna* is found in the blood only at night, the *filaria diurna* only during the day, whereas the *filaria perstans* is to be found at any time of the day or night. It is believed that the West Indian species is diurnal in habit, although the point has not as yet been accurately determined. This peculiarity of habit must be carefully kept in view.

Travellers and residents in tropical and sub-tropical countries would confer a boon on zoological and medical science by investigating this subject; or, if they have not the necessary leisure and apparatus for such investigations themselves, if they would make collections of blood slides on a systematic plan, and afterwards, as opportunity offered, forward their collections to London for examination. Fifty slides from fifty inhabitants of any district would be sufficient to determine for all practical purposes the presence or absence of these or other blood parasites in that particular district. From what has been said as regards the periodicity observed by some species as to their times of appearance in the circulation it is evident that it would be well to prepare two complete sets of slides, one of day blood, the other of night blood.

The following directions may be of assistance to anyone willing to co-operate in this investigation. If further information is required, Dr. Patrick Manson, 21, Queen Anne Street, Cavendish Square, London, would be pleased to supply it. A summary by Dr. Manson of what is known on the subject up to the present will be found in "The Hygiene and Diseases of Warm Climates," edited by Dr. Andrew Davidson.

Directions to Travellers, Missionaries, Residents, and Others in warm climates for the preparation and storing of slides of dried blood.

Objects to be kept in view:—

1. To ascertain the endemic areas of the different filariæ of the blood.
2. To ascertain the proportion of the population affected within the endemic areas.
3. To ascertain if particular villages or districts are specially affected whilst others are exempt.
4. To ascertain if the parasites are associated with particular diseases, and if so, which parasite with which disease.
5. To ascertain the influence of race, age, sex, occupation, &c., and any other point of interest.

Materials Required.

Ordinary glass microscope slips, 3 inches by 1 inch, or sheet glass from which such slips could be cut. One or more thousand of such slips should be prepared. On each end of the slip a label, 1 inch by $\frac{3}{4}$ of an inch (the greater length being across the slide), of cardboard or thick paper should be gummed, so as to leave a space of an inch and a half in the middle of the slide uncovered to take the blood. A box, such as is commonly used for carrying microscope slides; it should be made of wood, and nailed or screwed, or otherwise constructed to stand heat and damp; it ought to be capable of holding thirty or forty slides. Several stout needles. A register with the following headings:—Number; name; age; sex; occupation; residence; water supply of same; travels; disease, if any; diseases of district or village, specifying particularly presence or absence of elephantiasis, sleeping sickness, craw-craw, &c.; date of preparation of slide; hour of preparation; remarks.

To prepare the Slides.

Clean the slides very carefully. Slightly constrict the last joint of the blood-giver's finger by making three or four turns of a string round it. Prick the pad of the finger so constricted with a clean sharp needle. When a droplet of blood has exuded, or has been squeezed from the prick, transfer it to the glass slip on the same side as that to which the labels are affixed. Do this by dabbing the middle of the slip several times on the drop of blood, and then with a needle or glass rod spreading it in an even layer over an area of about three-quarters of an inch by an inch and quarter.

Then lay the slip so charged on its back, flat, protecting it from dust until it is dry. It should then be placed in the box and kept dry. The labels on the slips should be marked with the blood-giver's name, &c., and with a number corresponding to that in the register containing other particulars about him. When the box is full, the charged slides should be packed away in boxes, preferably tin-lined, care being taken that they are quite dry. The slides should be tied together in bundles of a dozen or so. The thick labels will prevent the blood charged surfaces from coming in contact. The amount of blood spread on any slide should be sufficient to produce a diaphanous film having a certain depth of tint, but not too deep, as in that case the film cracks on drying and is too thick to admit of easy and successful examination subsequently. It should have a pale yellowish red diaphanous look. It is very important that the slips should be kept dry; if damp they become covered with various cryptogamic growths which obscure any filariæ they may contain.

Funeral Rites and Ceremonies amongst the "Tshinyaï" (or "Tshinyungwe.")[1]

By Lionel Decle.

When a man is dead his relatives at once begin to make a great noise and to express their grief with unhuman howlings. After a few hours they wash the dead, and dress him with his best clothes, *i.e.*, two yards of calico round his waist; his arms are then stretched along his sides, and the body is wrapped in a piece of calico that has been previously dipped in saffron. The corpse is kept for two days in the house, during which time an incessant howling is maintained; when it begins to smell too strongly the funeral is proceeded with. A hole is dug *in the house*, and the corpse, after being wrapped three times in a mat of reeds is lowered into its grave; thorn bushes are first thrown over it, and then the hole is filled with earth and carefully levelled. Above the place where rests the head of the dead a large pot filled with meal is placed, and near it a little porridge and a roast fowl are left. Then all the people clap their hands, bidding good-bye to the departed, and all retire. The house is closed and abandoned. If the dead man was a chief the whole village is abandoned.

After the ceremony all those who have touched the corpse go and wash in the river, and return near the house, and after more crying all the relations of the deceased get their hair cut off, collect it carefully, and carry it to a place where two roads meet. Three months later the ceremony of the *Bona* takes place. A large quantity of *Pombe* having been prepared, the relations and their friends repair to the house in which stands the grave. Outside the house a hole is dug, and a pot of *Bombe* placed in it; this pot is

[1] These are the generic names of the tribes of the Zambezi near Tete: they extend to the N. as far as the Mussanangwe River.

then covered with a wooden dish in which a small quantity of flour is dropped.

The door of the house is then opened and a sheep brought in. After removing the pot that had been left above the head a small hole is dug in the same spot, and *Pombe* poured in it. The sheep is then slaughtered, its blood being allowed to run into this same hole: the carcass of the animal is taken outside, and the door once more closed up. The meat is cooked and eaten by the mourners, who wash their hands in the *Pombe* that has previously been placed in a hole before entering the house.

The funeral procession then retires as follows: One of the wives of the deceased is carried on the shoulders of a man, and followed by all the people who clap their hands, whilst some of them beat drums. This woman is called Musimo (the spirit), her head is covered up with a piece of calico, and on the way she constantly calls out for *Pombe*, and when this is brought to her she drinks it under the calico covering her head. The procession goes in this way to the house of the head widow, outside which a large hole has been previously dug and well cemented. *Pombe* is poured in this hole, and everyone lies down and drinks the *Pombe* without help of spoon or vessel. A great feast then follows, consisting of meat and *Pombe*, and everyone dances at the sound of "batugues." It is only then that the heir is placed in possession of his inheritance, and when mourning has been worn it is then discarded. The property goes to the son of the chief wife if he has reached the age of manhood, or to the chief wife herself if her son is a minor. The chief wife is *usually* the first wife, but not always, a man having the right to make anyone of his wives his chief or head wife.

Only men of a certain standing are buried in their own house. Common people or slaves are either thrown into the Zambezi and soon devoured by the crocodiles, or else placed in some hole amongst the rocks.

The Arungo and Marombo Ceremonies amongst the Tshinyungwe.

By Lionel Decle.

When a person of certain position falls ill a doctor[1] is called to perform the ceremony of Arungo. The doctor is always a woman. On her arrival the sick person sits on the ground with a small basket on his side. The doctress[2] passes her hands along his body and his legs, and pretends to place what she has drawn out of him in this way in the basket, this basket has a special name (Msitsha); his relations then do the same; it is the "Musimo"

[1] Before the doctor performs any ceremony her fee has to be paid in advance. This fee consists of eight fathoms of calico, one goat, and five panchas (about 300 lbs.) of Mapira, kind of millet.

[2] Niabezi.

(spirit) that is supposed to be drawn out of his body and placed in the basket. A piece of calico is then placed over the basket, and well tied up with bark string, in order to prevent the Musimo from escaping. The basket is left in a corner of the hut until the next day when the doctress returns. She goes to the basket, and taking it up, addresses the Musimo that is in it, usually in the following terms:

"You are well, are you not? You have slept well?"

The Musimo replies from his basket by a low whistle.[1]

The doctress translates this to the family: "The Musimo says that he has already died once, and that he feels well."

"Are you well in this basket?" adds the doctress, "and will you remain in it?"

Another low whistle from—the basket.

"Yes, yes," says the spirit, "I am quite well, and I wish to remain where I am."

Three days later the Marombo is performed. The sick man goes with his family to the doctress's house, where *Pombe*[2] has been prepared. He is placed on a mat, the head covered with a piece of calico with a gourd on the top of it. The doctress begins to dance in an excited way; the patient moves his head about gently at first, then more quickly, as the doctress gets more excited in her dance. As soon as the gourd placed on the patient's head falls down he rises himself, and begins also to dance, a sign that the sickness is about to get out of his body. All of a sudden the doctress stops short, and placing her hands to her heart, falls down in a faint (?). The "Musimo" is well out of the patient.

Shortly afterwards the doctress cuts the throat of the goat that has been handed over to her as part of her fee; she collects the blood in a spoon, and mixing it with *Pombe* makes the patient drink this. He is now well rid of the "Musimo." Of course, he may still be suffering from the effects of the Musimo's passage in his body, in which case against further payment—in advance—the doctress will give him medicines, and—curiously enough, sometimes cure him. The chief remedies used by these native doctors are purgatives, astringents, and emetics made out of plants and roots. They also use certain woods, the external application of which causes first-rate blisters.

The Ma-Goa.

By Lionel Decle.

[WITH PLATE XX.]

During my journey from Zumbo to Tete I stopped for nearly a fortnight near Tshikoa some ten miles W. of the entrance of the Quebra-baço[3] gorge.

[1] A most clever effect of ventriloquism performed by the doctress.

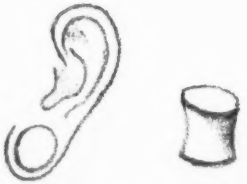
[2] Native beer made of fermented *mapira*.

[3] Quebra-baço, the old Portuguese name for these falls means "break the spleen" from the violence with which the paddlers must paddle against the lower rapids.

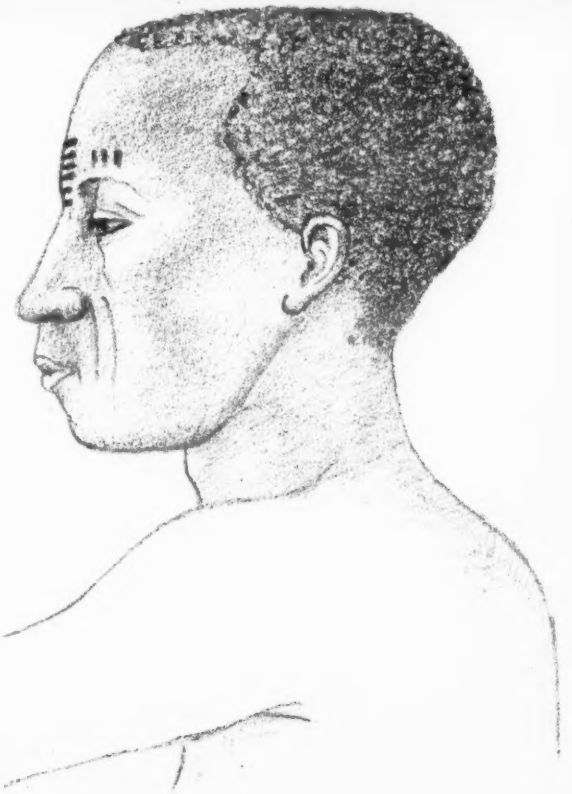
Ma-Goa Woman.

Iniamecuta near Tschikoa.
Upper Zambezi.

Tattooing Knife



Mapérerè.



Ma-Goa Man.

Hanfstaengl Photo-Litho

I was very much struck with the appearance of some of the natives I met there, as they differed so thoroughly from all the people amongst whom I found them; much lighter in colour, their features are altogether different from those of all the natives I came across so far. What struck me mostly in them was the straightness of the lip and of the nose; in fact amongst most of them the lip falls almost at a right angle from the nose; their lips are also small and well shaped. On the other hand their cheek bones are prominent like those of the majority of natives of Africa. Their eyes however are larger, more opened, and do not present the veiled appearance usually characteristic of the Bantu tribes.

They cover themselves with a large number of incisions on the face, neck, and body: the women wear a brass ring in the upper lip: the incisions made on the face and body are very deep and leave a heavy raised cicatrice of a blueish colour obtained by the application of certain ashes upon the wounds. The position and designs of these marks are very similar to those we find amongst the *Tawala* living between the Daki and Musanangwe rivers. The Ma-Goa I have just described seem to live on the banks of the Zambezi, chiefly on the left bank of the river in the vicinity of the Quebra-baço gorge: they are in small numbers and are very little known. From what I could gather, they are, if not the original, at least the oldest inhabitants of this region. The women wear huge buttons of ivory[1] in their ears, as shown in the accompanying sketch. They manage, after gradual training, to insert in their ears pieces of ivory of nearly 1 inch in diameter. Besides distending the ear the great weight of these Mapéréré causes the ear to become of a tremendous length.

I enclose a copy of a sketch I took from nature of a man and a woman of this tribe: the likeness is, I have been told, quite correct, but of course the drawing—as a drawing is miserable.

I had unfortunately no time to study these people as I should have liked to do, and I have alluded to them hoping that by calling attention to them some other traveller will observe them more closely and tell us whether they are really worthy of special investigation.

The Watusi.

By Lionel Decle.

Of all the various African races, the Watusi are amongst the least known, although they certainly deserve a special study. They have, so far, been described under the name of Wahha, but the latter are really but the greatest tribe of the Watusi race. These

[1] These buttons are called Mapéréré; it strikes me that this is the same word as the Pélélé of the Mañanja, a similar ornament, but worn in the upper lip; the Ba-Senga women also wear this ornament (?) in the upper and lower lip, but call it *Tshindanda*. The Ba-Senga live in the immediate neighbourhood of the Ma-goa.

Watusi are to be found close to Lake Tanganika on its eastern side, but do not come so far as the Lake itself, being separated from it by the Wajiji and the Warundi. The limits of their habitat can be roughly defined as follows: to the W.[1] 30° 30′ long. E., to the S.[2] 4° 50′ lat. S., to the E.[3] 31° 40′ long E. They extend to the N. so far as the Waruanda[4] country and they are from what I have been able to gather closely connected with the latter.

Few travellers have so far come into close contact with the Watusi or Wahha, as they are more commonly called by travellers. Stanley crossed a very slight portion of their country; more recently Dr. Baumann crossed a large portion of the northern part of Uhha (the land of the Wahha), but I have not yet been able to see his observations on these people. I am the first traveller who has crossed the whole southern part of the Uhha country, this, on my way from Ujiji to Urambo, and I was very much struck by the extraordinary difference that is to be found between them and their Bantu neighbours. Pure types are not common and are only to be found amongst the aristocracy—if I may use such an expression for Africans. The mass of the people have lost their original type through intermixture with neighbouring tribes.

The pure types have long thin faces with a long fine nose and a small mouth, their colour is of a rich brown without the violet black tints usually found in the Bantu races. But what is most striking in them is their hair; it does not grow in woolly patches of a dull colour, but is of a glossy black evenly spread all over the head and with but a slight curl in it. In fact it looks very much like the hair of the Abyssinians. The Watusi range in height from 5 ft. 6 to 5 ft. 8: their hands and feet are small. In fact they appear to me like a kind of connecting link between the Abyssinian and Bantu types. They are very industrious; their huts are most comfortable, built in a bee hive shape; except where big chiefs live, no proper villages are to be found, but clusters of three or four huts disseminated all over the country. They use artificial bee hives made of a piece of bark about 3 ft. long and covered with grass; the extremities are closed by coils of grass, a small hole being left at one of the ends. They place these in the trees and gather in this way large quantities of honey. They have large numbers of splendid cattle with huge horns; some of the bulls reach over 16 hands. Chesnut seems to be their favourite colour.

Each cow gives daily about three quarters of a gallon of milk, out of which they make butter: they have a curious custom connected with the making of it. All the wooden jugs used to gather the milk and the calabashes in which they make butter are cleaned (?) with urine. They pretend—and this I need hardly say is quite wrong—that otherwise no butter can be got from the milk.

[1] There the Wajiji begin.
[2] The Wavinza are their neighbours there.
[3] There the Wanyanwezi begin.
[4] The Waruanda call themselves white men, and deny all connection with the Bantu tribes.

In the evening when the cattle are brought into their kraals, the shepherds light large fires round which the animals gather; their tameness is most remarkable.

In the Musérere valley, amongst the Unyonga mountains, for the first time in the whole of my journey through Africa I found artificial irrigation.

The costume of the women consists of bark cloth fastened above the breasts and falling below the knees. They wear heavy bracelets of brass that they manufacture themselves; the copper however is not found in the country, and these bracelets are made from brass rods bought from the Arabs and melted down: little or no beads are used as ornaments, and their ears are neither pierced nor deformed. Men and women wear round their ankles innumerable coils of iron wire representing sometimes a weight of many pounds.

The men cover themselves either with a skin or a piece of bark cloth tied with a string over the right shoulder and falling down to the knees. Their ornaments are numerous: almost every man wears round his neck some charm filled up with "dawa" (medicine); the most common of these charms consists of two pieces of ivory hollowed out (see sketch).

An ornament to which they attach great value and that is only possessed by a few is made out of a circular hippopotamus tusk sliced in the middle and reduced to the thickness of a strong paper-knife; they tie these with a string on the right side of their necks, the pointed end sticking out at the back of their neck. Heavy ivory bracelets about 3 inches long and nearly 1 inch thick are also much appreciated; those who cannot afford ivory make them of wood.

But where the Watusi excel is in the art of basket-making; they make beautiful soft baskets for sifting flour, grass cups that hold water as well as any glass; their prettiest work of this kind is to be found in the covers they make for their milk jugs. All this basket-work is ornamented with interwoven designs in black straw.

The bow and arrows are their chief weapon; the bows are very large, from 5 to 6 feet high, and ending at both ends in a sharp point; the strings are made of sinew and of perfect workmanship. The arrow heads are of two different shapes, the more commonly used is the broad arrow, the second one is lance shaped with barbs on the stem. They are fixed on to the wood either with bladder or with stripes of banana wood; the opposite end is notched and has feathers. For killing birds they use arrows with heavy wooden heads. They themselves manufacture the iron heads, but the iron comes mostly from the Wanyamwezi country. I have never seen poisoned arrows amongst them, and I believe that they are not used; when I came through the village of 'Mtali, one of the principal chiefs of the country, the people were daily expecting to be attacked by Untagazo, another big chief; all the people were armed to the teeth, but I never saw one single poisoned arrow; unfortunately the war only broke out after my departure so that I cannot speak of their tactics. Besides bows and

arrows each man carries two assageïs. On the part of the Malaglarazi river that runs through their country they have boats, a few hollowed out of borassus palms but most of them made of bark sewn together and held out by cross pieces of wood. These boats, or rather bark canoes, when empty, are all distorted, and so fragile-looking that one would hardly think that they are able to support the weight of a man, but I have seen them filled up with seven natives and several loads, standing perfectly steady.

Of the Kitusi language I can say nothing; one thing is however certain: they understand Kinyamwezi.

These notes on this most interesting race are of course very short, but I could not study the people as I should have liked to do. During the whole time I travelled through their country they tried to break into my camp almost every night, and they even succeeded in carrying away a large number of my things besides two guns. It was with the greatest difficulty that I avoided an open fight with them, and of course under the circumstances a thorough study of the people was out of the question. As to measurements I could not find one single man who would allow me to measure him. I only managed with the greatest difficulty, and through the attraction of a large present, in measuring two women.

MEASUREMENTS OF TWO WATUSI WOMEN.

	Age Between 25 and 30.	
	No. 1 (see sketch.)	No. 2.
	ins.	ins.
Standing height	66	65
Height to chin	56½	56
Max. length of head	8½	9
„ breadth „ „	4½	—
From root of nose to Inion	15	14
Greatest circ. of head	22	21½
Tragus to Tragus over top of head	13½	12½
Length of nose	2	2½
Breadth „ „	1¾	1½
Circumf. of neck	10¾	10⅝
„ „ wrist	6	5½
„ „ chest	30½	31½
„ „ waist	26	27
Span of arms	69	65
Length of hand	8	7
„ of foot	10	9
Cubit	18½	17½
Length from ground to point of middle finger	24	24
Colour of skin	Between 29 and 30 (Broca's table).	
„ „ eyes	Brown.	
„ „ hair	Glossy black (41 of Broca's table).	

Annual Report of the Bureau of Ethnology (Smithsonian).

By A. W. Buckland.

The ninth annual "Report of the Bureau of Ethnology" (Smithsonian) brings that carefully prepared and elaborately illustrated work up to the year 1888. Three volumes have been issued in quick succession, so that perhaps the publication may soon be brought up to date. Each of the later volumes has also been accompanied by a bibliography of various Indian tribes, of great use to students, but not of so much general interest as the papers in the body of the work.

Of these we may note in vol. vii an important paper by the Director on "Indian Linguistic Families," accompanied by a map showing the distribution of the various linguistic stocks, of which the Athapascan and the Algonquian now occupy the largest amount of territory, although the Esquimauan seems to have extended all round the northern coasts to the Gulf of St. Lawrence, whilst on the Pacific coast there is a singular intermingling of all the continental tongues with many which apparently do not extend into the interior, suggesting either a constant struggle for possession of the seaboard, or frequent immigrations from the Pacific.

Both the people and the languages of the vast American continents are unsolved riddles. Ethnologists regard all the numerous tribes as belonging to the same Mongoloid race, yet the languages spoken appear to be more numerous and diverse than in other parts of the world occupied by various races. North of Mexico to the arctic regions, Major Powell reckons fifty-eight linguistic families, each containing several tribes, and of these he says, "It is believed that the families of languages represented upon the map cannot have sprung from a common source; they are as distinct from one another in their vocabularies, and apparently in their origin, as from the Aryan or the Scythian families," and again he says, "There is little reason to doubt that, as the result of investigation in the field, there will be discovered tribes speaking languages not classifiable under any of the present families."

"All the families occupy the same basis of dissimilarity from one another, *i.e.*, none of them are related, and consequently no two of them are either more or less alike than any other two, except in so far as mere coincidences and borrowed material may be said to constitute likeness and relationship," and he adds, "There is not a single Indian linguistic family which does not contain words similar in sound, and more rarely, similar in both sound and meaning, to words in English, Chinese, Hebrew, and other languages."

Notwithstanding the manner in which these linguistic stocks have become widely separated in some parts and intermingled in others, reminding one of the changes in a kaleidoscope, Major Powell, contrary to the common opinion, regards the Indians as

sedentary rather than nomadic, and traces many of the dialects to internecine strife. "Factions," he says, "divided and separated from the parent body, by contact, inter-marriage, and incorporation with foreign tribes, developed distinct dialects or languages." But if languages have thus arisen, it does not seem possible that they could have become so totally dissimilar as these appear to be.

The subject is an extremely difficult one, and is confessedly in its infancy, but the Director of the Bureau of Ethnology and his able assistants are doing much to bring order out of chaos.

In continuation of his linguistic studies, Major Powell is preparing a map to show the original habitat of the several tribes, a comparison of which with the one now issued will be of great interest.

As bearing upon Major Powell's belief in the generally sedentary character of the Indian tribes, Mr. Victor Mindeliff's exhaustive "Study of Pueblo Architecture," in vol. viii, deserves especial notice. The Pueblos extend over an immense tract of country, chiefly in New Mexico and Arizona, and include those remarkable cliff dwellings in the Canyon de Chelly and the Chaco Canyon, the description of which is not included, being left for a future article.

The architecture of all the Pueblos appears to be of the same type, consisting of square stone-built houses or lodges, built in terraces one over the other, or partly scooped out in sandstone cliffs, access to most of them being by ladders. Some of these Pueblos are still inhabited, but many are ruined and deserted, the age of these remaining undetermined, although some have certainly been occupied since the Spanish Conquest.

From the general likeness of all these dwellings, Mr. Mindeliff believes that both the ancient and modern Pueblos have been constructed by the same tribes at various periods, even the most ancient by the ancestors of the present Zunis, Navajos, Apaches, and kindred tribes. The traditions of the present inhabitants treat of many migrations, owing to wars, famines, and other disturbing elements, and contain many curious myths of the origin of the various cognate tribes.

Every Pueblo contains several *kivas*, that is, buildings devoted to the religious ceremonies of the people. These kivas are all built on one plan, and are apparently, as a rule, oriented to the south-east. The corner-stones are laid at the cardinal points by a medicine man, with special prayers, and when finished the kiva is consecrated by a sprinkling of sacred meal and the hanging up of prayer sticks.

The ancient kivas are supposed to have been circular in form, but the modern are all rectangular and partially subterranean. One peculiar feature is that each is furnished with a hollow about a foot deep, covered with a slab of wood, in which is bored a hole fitted with a wooden plug. This is the holy of holies, round which the fetishes are placed; it represents the hole through which the human race emerged after their creation in the lower world; for

the traditions of all these Pueblo Indians say that men were created in a dark cavern, whence they reached the upper world by four stages, all of which are represented in the kiva, as also the magic pine tree or reed by which they ascended, which is typified by a ladder always of pine. This myth seems to bear a strong resemblance to the story of Jack and the beanstalk. There is another which probably accounts for the orientation of the kivas, and which appears to be of considerable importance; it relates that a brilliant star arose in the south-east which would shine for awhile and then disappear. The old men of the Snake people said, "'Beneath that star there must be people'; so they determined to travel toward it. They cut a staff and set it in the ground, and watched till the star reached its top, then they started and travelled as long as the star shone; when it disappeared they halted, for the star did not shine every night, for sometimes many years elapsed before it shone again. When this occurred our people built houses during their halt; they built both round and square houses, and all the ruins between here and Navajo Mountain mark the places where our people lived."

It is a curious fact that among these Pueblos are found rows, squares, and circles of upright stones, and stone pillars, the latter of which, whatever may have been their ancient use, serve at present "as a datum point in the observations of the sun, made by a priest of Zuni, for the regulation of the time for planting and harvesting, for determining the new year, and for fixing the dates of certain other ceremonial observances." There are also found in the walls of some of the houses stones bored with large circular holes, said to have served as doorways, but as the usual doorways are square, it seems probable that the holed stones had some ceremonial use, analogous to that ascribed to similar stones in the eastern hemisphere.

It is impossible to touch upon the numerous points of interest connected with the masonry and ornamentation of these Pueblos, but it may be necessary to treat of some of them when the promised paper on the Canon de Chelly appears.

One article in each of the three latest volumes is devoted to Indian myths and ceremonies. That upon the Midé-wiwin or "Grand Medicine Society of the Ojibwa," by W. J. Hoffman, is a full account of that remarkable combination of magical rites and jugglery, with a certain amount of medical skill in the administration of herbal remedies. In this great secret society there are four grades, the admission into each being accompanied by many curious ceremonies in which the sacred medicine bags play a great part, being employed, as is supposed, to shoot into the body of the candidate the migis shell, the sacred emblem of the society. The shaman who has passed into the fourth grade is believed to be possessed of miraculous powers. In all these ceremonies the number four and its multiples are constantly employed, and crosses symbolical of the cardinal points, and painted in accordance with the custom of the tribe, are set up as sacred objects The records of the

society consist of remarkable pictographs or hieroglyphics on birch bark, and appropriate songs accompany every ceremony.

Mr. Mooney's article upon "The Sacred Formulas of the Cherokees," vol. vii, forms as it were a supplement to that on the Midé-wiwin of the Ojibwa. It contains the medical and magical formulas employed by Cherokee shamans in all diseases, consisting of invocations to animal gods, the Sun, Thunder, Fire, Water, the Red Man, the Red Woman, Little Men, and Little People, or Fairies, who are invoked in mystical songs, not only in cases of sickness, but for success in love, war, or hunting, or to destroy an enemy, the means employed recalling those in use for the same purpose by witches in Europe. In these invocations a very archaic language is used, a kind of sacred tongue, hardly understood even by the shamans.

The ceremonial of Hasjelti Dailjis and Mythical Sand Paintings of the Navajo Indians, by James Stevenson, vol. viii, appears to be a variant of the ceremonies described by Dr. Washington Matthews in "The Mountain Chant," and gives four more of the remarkable sand paintings employed by the Navajos in their healing ceremonies. The elongated figures surrounded by the anthropomorphic rainbow are similar to those of the Mountain Chant, but the combinations are different. The use of a square of four sticks tied at the corners, to symbolize the four winds, seems to give a clue to the meaning of this figure as found on engraved shells, and in Mexican paintings. There is also an elaborate description of the preparation of various medicine tubes, and of the foods eaten during the ceremonies. The use of masks in the initiation ceremonies is described, as also the sprinkling of sacred meal or corn pollen, which appears to be identical with the Hoddentin described by Capt. John Bourke in his article on "The Medicine Men of the Apache" in vol. ix, by whom it is compared with a powder used in the East and in Japan, as a curative agent and rejuvenator, which according to Capt. Bourke represents everywhere the principle of fertility. Capt. Bourke's paper is full of interesting analogies between the practices of the Indian shamans, and the symbolism employed by them and similar usages in the Old World. The most suggestive perhaps is the use of sacred cords among so many different races in Asia, Africa, and America, as compared with priestly girdles and rosaries, and the use of coloured threads in medicine. It is impossible to name the many curious resemblances brought forward by Capt. Bourke, some of which are perhaps somewhat far-fetched, but the paper is well worth careful study by anthropologists.

The whole of vol. ix is taken up with this paper, and an extremely lengthy one by John Murdoch, on the "Ethnological Results of the Point Barrow Expedition," describing and fully illustrating the natives, their mode of life, tools, and household arrangements, religious and medical observances, preparation of food, drink, dress and ornaments, their dancing masks, amulets and remarkable carvings in bone and ivory, their music and

songs, and mode of disposing of the dead, showing them to be a simple and ingenious people, but not differing greatly from other Eskimo tribes.

"Ethnographische Beschrijving van de Westen Noordkust van Nederlandsch Nieuw-Guinea." By F. S. A. de Clercq, with the assistance of J. D. E. Schmeltz. pp. 1–15, 1–300, with 42 plates and 51 illustrations in the text. 4to. Leiden. P. W. M. Trap. 1893. In this handsome volume Messrs. de Clercq and Schmeltz have given to anthropologists the most complete account hitherto published of the handicrafts of the natives of the north and north-west portions (from Humboldt Bay to MacClure Gulf) of Netherlands New Guinea and the adjacent islands, including Waigéoe and Misol. The native name, locality, measurements, and other details are given of the 682 objects figured in the plates. These comprise articles of personal adornment, such as combs, head-dresses, earrings, necklaces, breast ornaments, armlets, belts, &c. (pls. i.–xiii.); utensils and weapons, including gourds, mats, baskets, pipes, adzes, ladles, pillows, paddles, canoes, prow-carvings, &c. (pls. xiv–xxxiii); various objects (pl. xxxix); pls. xxxiv–xxxviii are devoted to religious objects, there being two plates of *karwars*, two of charms or talismans, and one of painted skulls and other objects. The last three plates contain coloured figures of twenty men from various districts, illustrating the method of dressing the hair, wearing ornaments, and tattooing. The plates, only seven of which are plain, are executed by P. W. M. Trap, and those who know the valuable Internationales Archiv für Ethnographie will know what technical excellence to look for in the illustrations.

The work is divided into three principal parts. Part i. (pp. 1–188) includes the descriptions of the objects noted above. The second part (pp. 189–252) is a careful essay on the distribution in New Guinea of those objects and customs which are illustrated in the monograph, such as food, stimulants, clothing, ornaments, tattooing, houses and house furniture, fisheries, agriculture, transport (canoes, &c.), trade, implements, pottery, weapons, armour, sacred houses, bull-roarer, musical instruments, dance masks, cult of the dead, and talismans. This is followed by four large tables giving the distribution of 164 items in 24 localities in Netherlands New Guinea, 10 in Kaiser Wilhelms-Land, 15 in the British Protectorate, as well as columns for the Indian Archipelago, Australia, Melanesia, Polynesia, and Micronesia. There is also a section on decorative art (pp. 245–252). The volume concludes with a really wonderful bibliography supplemental to Rye's "Bibliography of New Guinea" (Proc. Roy. Geogr. Soc. 1884); besides giving a list of maps and charts, 275 references are cited for travel, &c., 12 for anthropology, 90 for ethnology and ethnography; language, hygiene, meteorology, zoology, botany, and geology are also represented. The volume is well indexed.

From the foregoing account it will be evident that this is a

really important monograph, as it touches on so many subjects, and has been compiled with great care and erudition. Heer de Clercq collected the specimens (which are now in the Rijks Ethnographische Museum in Leiden), and gave their native names, and all the notes not within square brackets of Part I. The descriptions of the objects, and the comparative portion of the memoir we owe to Herr Schmeltz.

The distribution tables will prove very useful, and especially so for those who are not acquainted with the ethnographical literature of Netherlands and German New Guinea; we may assume these to be as complete as possible. Several additions and a few corrections might very well be made in the items for the British Protectorate.

In conclusion, it is only right to point out this is to a certain extent a Government publication, His Excellency the Minister of the Netherlands Colonies having granted a subsidy in aid. This is only one of the many proofs of the intelligent interest the Netherlands Government takes in its Colonies, and in furthering anthropological knowledge. It seems strange with our immensely vaster colonial jurisdiction, and the variety of its components that our government pays so little attention to that science, which is of the utmost importance so far as the inhabitants of those countries are concerned. As a nation we are more concerned with the emoluments than the responsibilities of empire.

Dr. O. Finsch has just brought to a close his "**Ethnologische Erfahrungen and Belegstücke aus der Südsee.**" The sub-title describes this as a descriptive catalogue of a collection in the Vienna Museum. It rarely happens that an ethnological collection in a museum is so fully described as this has been, but in this case the author describes the specimens he has himself collected. The following brief analysis will indicate the scope of Dr. Finsch's papers which have been published in the "Annalen des k.k. naturhistorischen Hofmuseums," Vienna, A. Hölder. The first part was published in vol. iii. (1888) pp. 83–160, pls. iii–vii. (two being coloured) and seven figures in the text; it deals with the Bismarck Archipelago (New Britain, and New Ireland, with a few notes on the Admiralty Islands, Hermit and Anchorite Islands, and Solomon Islands. The second part deals with New Guinea, and is divided into two sections relating respectively to the British and German territories. Vol. iii (1888) pp. 293–364, with pls. xiv–xxv (two coloured) and thirty-six figures in the text, contains an account of 1. British New Guinea, (*a*) the South-east coast, including the district between Torres Straits and Keppel Bay. Vol. vi (1891) contains (*b*) East Cape and d'Entrecasteaux Islands (pp. 13–33), (*c*) Trobriand (pp. 33–36). 2. Kaiser Wilhelms-Land (pp. 37–130). The third part is devoted to Micronesia and was published in vol. viii, (1893); it is illustrated by pls. i–viii (two being coloured) and sixty-five figures in the text. A general account occupies pp. 1–19, then follow the I. Gilbert Islands (pp. 19–89), II. the Marshall Archipelago (pp. 119–182), III. the

Carolines (pp. 182–193) with special accounts of Kuschai (pp. 193–230), Ponapé (pp. 231–275), Ruk and Mortlock (pp. 295–383). Finally from pp. 384–437 there is an appendix giving corrections and additions to previous statements and several indices. Dr. Finsch has wisely had all his articles consecutively paged, in addition to the pagination of the *Annalen*. The whole work thus consists of 675 pages, twenty-five plates (six of which are coloured) containing figures of 250 objects, and 108 illustrations in the text. This is more than a mere illustrated catalogue, for the author has incorporated original ethnological investigations as well as given authentic accounts of the various objects enumerated. Dr. Finsch's practice is to deal with each geographical area in the following manner. Introductory, including native plants and animals, &c.; physical anthropology; under ethnology he groups dwellings, food, stimulants, trade, music, dances, religion, and all the multifarious arts and crafts of the people. The series of papers forms an invaluable addition to the libraries of museums, and of those interested in the ethnography of the Melanesians and Micronesians.

(A. C. H.)

"Irish Druids and Old Irish Religions." By James Bonwick, F.R.G.S., F.A.I. &c. (Griffith, Farran, & Co., 1894). pp. i–viii, and 1–328, small 8vo. Under this title Mr. Bonwick offers to the world a vast collection of facts and opinions collected in "a lengthened course of general reading" about Irish and other Druids, idol worship, serpent faith, sun-worship, fire-worship, stone-worship, animal-worships, and will-worship, and dealing with (amongst other things) sacred plants, holy bells, crosses, round towers, and the Hill of Tara. Opinions are so much more numerous than facts respecting many of these subjects that it is no fault of the author if they seem occasionally to predominate in his pages, but it must be admitted that, while stating all the opinions that have come before him, including those of the Anglo-Israelites, he does not unduly favour any of them—not even the latter. The general impression derivable from reading the book is that much Irish Christianity was derived from Druidism, and that much Druidism was derived from very early, even unknown prehistoric races. All who are interested in these matters should place the volume on their shelves as a brief but handy book of reference, though its value in this capacity would have been greatly increased by more precise indications of the exact spot in each writer's works where the facts or opinions quoted may be found.

"The Germ-Plasm: A Theory of Heredity." By August Weismann. Translated by W. Newton Parker and Harriet Ronnfeldt. (Walter Scott, 1893.) pp. 477, 8vo. The volume, which is dedicated to the memory of Charles Darwin, deals with the material basis of heredity, the germ-plasm; heredity in its relation to monogonic reproduction, regeneration, multiplication by fission, multiplication by gemmation, alternation of generations

in its relation to the idioplasm, the formation of germ cells; the phenomena of heredity resulting from sexual reproduction, modifications of the germ-plasm caused by amphimixis, ontogeny resulting from the union of the germ-plasm of two parents, the phenomena of reversion in their relation to amphimixis, dimorphism and polymorphism, doubtful phenomena of heredity; the transformation of species; its origin in the idioplasm, the supposed transmission of acquired characters, variation. "According to our view, the power of transmission which is possessed by all organisms, and on which the development of the higher organic forms is based, therefore depends on simple growth merely in the case of the very lowest conceivable organisms with which we are not acquainted; while in all forms which have already undergone differentiation, it results from the possession of a special apparatus for transmission."

"**English-Sulu-Malay Vocabulary,**" with useful sentences, tables, &c. By Andson Cowie, edited by W. C. Cowie (North British Borneo Co., 1893). pp. 288.

"**The Geographical distribution of disease in Great Britain.**" By Alfred Haviland. (Swan Sonnenschein, 1892.) pp. 406. "The object of this investigation has been to point out to the medical profession not only where certain diseases *do* thrive, but where they *do not*; with the further object of leading others to inquire why this is the case in their own localities. When this inquiry first took place, in 1868 it was not anticipated that so vast a progress in tracing the causes of specific forms of diseases was at hand. Nevertheless, we find ourselves in full activity in a direction that gives reasonable hopes of discovering, why forcible winds should slay the consumptive; why the earth should afford a soil favourable to the culture of some organic form that is at the source of rheumatism and its frequent sequel cardiac disease; and the time may not be far distant when some of the many forms of micro-organisms that swarm in the sodden clay lands after floods shall be thoroughly examined and their forms and histories known, such investigations being followed by the discovery of those species that are the exciters through their poisons of malignant growths known as cancers; it may also come to pass that we shall find out on what the effect of calcareous soils on these species depend. Search will be made in the deltas and banks of tropical rivers for those organisms which render their malaria so fatal to the human race. And finally, it may be accorded to us to discover the means of protecting our bodies against pathogenic organisms which, from the vast abundance and wide distribution, we are unable to destroy before they attack us." The volume is well illustrated with coloured diagrams and contains various indices.

"**The Cliff Dwellers of the Mesa Verde.**" South-western Colorado, their pottery and implements. By G. Nordenskiöld (P

A. Norstedt, Stockholm) 4to., pp., 174. This magnificent work, containing 94 illustrations in the text, and 62 full page plates, gives a full account of our present knowledge of the subject. "I have described the antiquities of the Mesa Verde, which afford us a glimpse of the daily life of the cliff-dwellers. I have further described similar remains probably to be ascribed to kindred nations, and I have finally given a brief sketch of the modern Indians, whose habits remind us most strongly of the cliff-dwellers, adding to this sketch some details of the life led by the same Indians in the middle of the sixteenth century, as depicted by the Spanish invaders in their narratives. The primitive Pueblo culture as we find it in its typical development among the cliff-dwellers of the Mesa Verde may be traced almost everywhere within a sharply-defined region, the extent of which we have considered. It is evident the cliff-dwellers do not compose a race distinct from these Indians, but are related to them. While we must undoubtedly regard the Pueblo tribes as the descendants of nomadic Indians, the culture of the said tribes shows some very essential distinctions. In certain respects they unquestionably stood higher than their ancestors, the nomadic tribes; but the raising of corn, the tilling of the soil, no longer permitted a wandering life. The nomadic people became an agricultural nation with stationary dwellings. The cave dwellings perhaps represent in part this first grade of the Pueblo tribes' development. The further evolution of the cave dwellings may be traced without difficulty in their transition to cliff dwellings, the caves being divided by walls into several rooms, and . . . a pueblo on the mesa is thus, in fact, nothing but a cave dwelling built in the open instead of in a cave. We are not in possession of any facts that might entitle us to draw any conclusions regarding the date of the Pueblo tribes ascendency. It was probably several centuries earlier than the first visit of the Spaniards to their country. I shall conclude with a brief summary of the results at which I have arrived respecting the origin and development of the Pueblo tribes. They were nomadic Indians whose culture had been considerably modified, and in certain respects elevated by altered conditions of life. The evolution of this culture had nothing in common with that of the ancient Mexican civilization, but during its decadence it was perhaps influenced in some respects by the latter."

"The American Anthropologist." Vol. vi., No. 4. The Navajo, A. M. Stephen. A-wá-to-bi: an archæological verification of a Tusayan legend, J. W. Fewkes. Piñon gathering among the Panamint Indians, B. H. Dutcher. Polysynthesis in the languages of the American Indians, J. N. B. Hewit. Kuskarawaokes of Capt. John Smith, W. W. Tooker. Aboriginal remains of the Piedmont and valley region of Virginia, G. Fowke. The World's Fair Congress of Anthropology, W. H. Holmes. Anthropology at the Madison Meeting, W. J. McGee. Anthropological bibliography.

"Transactions of the Asiatic Society of Japan." Vol. xxi. Esoteric Shintō, P. Lowell. On the manners and customs of the Loochooans, B. H. Chamberlain.

"Journal of the Anthropological Society of Bombay." Vol. xxxiii., No. 3. On Hindu ceremonies observed in the Madras Presidency, M. S. Husain. The first year funeral expenses of a Parsee of the last century (1763), B. B. Patell. On some additional folk beliefs about the tiger, S. C. Mitra.

"Journal of the Asiatic Society of Bengal." Vol. lxii., Part 3, No. 1. The Hindus of Eastern Bengal, (late) Dr. Wise. The marriage customs of Thibet, Babu Sarat Chandra Das. Measurements of Cingalese Moormen and Tamils, 1892, H. H. Risley. No. 2. Modern customs among the Bedouins of the Haurán, Col. H. S. Jarrett. No. 3. Notes on Anthropology, H. H. Risley. On some superstitions regarding drowning and drowned persons, Chandra Mitra. On some beliefs in a being or animal which is supposed to guard hidden treasure, Chandra Mitra. Anthropometric instructions.

"The American Antiquarian." Vol. xvi., No. I. Origin of the Indians, Cyrus Thomas. Was the serpent symbol aboriginal? S. D. Peet. Characteristics of American languages, D. G. Brinton. The Suastika and allied symbols, C. S. Wake. Prehistoric pottery from the middle Mississippi valley, J. D. Butler. Japanese art on Puget Sound, J. Wickersham.

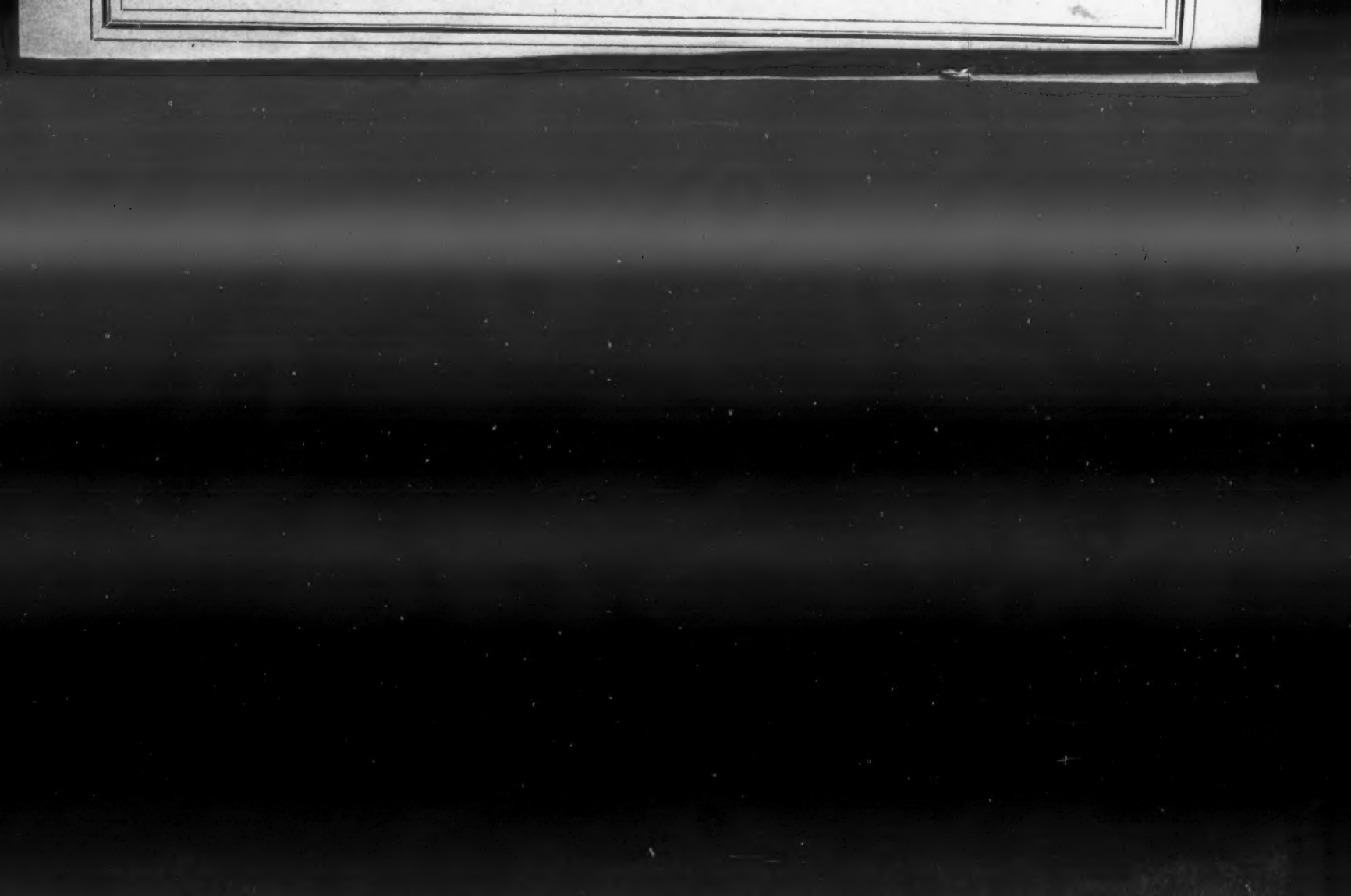
"Bulletins de la Société d' Anthropologie de Paris." Vol. iv., No. 5. Origin of circumcision among the Jews, Letourneau. Prehistoric station at Prévilliers (Oise), Raymond. Megalithic inscriptions, de Closmadeuc and Bonnemere. Quaternary beach near Lion-sur-mer, Viré. The Ainos, Michaut. No. 6. Neolithic station at les Hogues, near Yport, Capitan, and Jamin. Palæolithic bed at San Isidro, near Madrid, de Baye. Experiments on various arrow poisons, Rondeau. No 7. Neolithic station at St. Aubyn, near Elbeuf, Capitan. Neolithic funeral grotto at Livry-sur-Vesle, Schmit. No. 8. The dolmen at La Fontaine (Loire et Cher), A. Couette. The normal origin of crime, Manouvrier. The Danakils (between Massaouah and Lake Assal), Dr. Santelli. No. 10. Replies to anthropological questions from the Island of Halmaheira, Dutch Indies, Van Baarda.

"Revue Mensuelle de l'école d' Anthropologie de Paris." Vol. iv., No. 2. Dwellings in the bronze age, De Mortillet. No. 3. Notes on the Somalis, Santelli.

"L'Anthropologie." Vol. iv., No. 5. Merovingian and Carolingian skulls, Dr. Hamy. Several cases of Albinism observed at Mahé, Deschamps. Map of the districts of auburn hair, Topinard. No. 6. Some conclusions and applications of Anthropology, Topinard. Note on the relation of the length of the trunk to

the height, Féré. Vol. v., No. 1. Sculpture in Europe before Græco-Roman influence, Reinach. Migrations in Central Asia from a geographical point of view, Capus.

"Societe de Borda." Vol. xviii., No. 2. Antiquity of man in the Department of the Landes, Dubalen. Grammar of the idioms of the Landes and Gascony, Beaurredon. No. 3. Idioms (cont.).



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MEETINGS DURING THE SESSION 1893–94.

1893.	TUESDAY,	NOVEMBER	14.	1894.	TUESDAY,	MARCH	13.
	„	DECEMBER	12.		„	APRIL	10.
1894.	„	JANUARY	9, 23.*		„	MAY	8.
	„	FEBRUARY	13.		„	JUNE	12.

Specimens are Exhibited, and Coffee served at 8 p.m.; Reading of Papers commences at 8.30.

Each Fellow has the privilege of introducing two friends (ladies or gentlemen) to the Evening Meetings.

*ANNIVERSARY MEETING.

The Council meet at Five o'clock on the days of Ordinary Meeting.

CONTENTS—*continued.*

PAGE

MEETING OF JANUARY 9th, 1894. Professor A. Macalister, F.R.S., President, in the Chair - - - 362

Ethnological Notes on New Hebrides (*continued*). By Lieutenant Boyle T. Somerville, R.N. - - - - 363

Diseases in the New Hebrides. By Dr. McNabb, Surgeon R.N. - - - - - - - - - - - - 393

ANNUAL GENERAL MEETING, JANUARY 23rd, 1894. Professor A. Macalister, F.R.S., President, in the Chair. Treasurer's Report for 1893, Report of Council, President's Address - - - - - - 396

ANTHROPOLOGICAL MISCELLANEA and NEW BOOKS—

Blood Parasites, with Directions for Preparing Slides of Dried Blood - - - - - - - - 418

Funeral Rites and Ceremonies amongst the "Tshinyaï" (or "Tshinyungwe"). By Lionel Decle - - - 420

The Arungo and Marombo Ceremonies amongst the Tshinyungwe. By Lionel Decle - - - - - 421

The Ma-Goa. By Lionel Decle. (With Plate XX) - 422

The Watusi. By Lionel Decle - - - - - - 423

Annual Report of the Bureau of Ethnology (Smithsonian). By A. W. Buckland - - - - - - 427

INDEX - - - - - - - - - - - - - 439

The Council desire it to be understood that in giving publicity to the Papers read before the Institute, and the discussions thereon, they accept no responsibility for the opinions or statements of individual authors.

Fellows of the Institute are earnestly requested to add copies of any photographs of anthropological interest which they may possess, or be able to obtain, to the collection in the library.

CONTENTS.

No. 87, MAY, 1894.

b 28 5

PAGE

MEETING OF DECEMBER 12th, 1893. F. W. RUDLER, Esq., F.G.S., in the Chair. Afterwards Professor A. MACALISTER, F.R.S., President - - - 265

Remarks on the Flint Implements from the Chalk Plateau of Kent. By A. M. BELL, M.A. (With Plates XIV, XV, XVI) - - - - - - - - 266

A Critical Study of the Collection of Crania of Aboriginal Australians in the Cambridge University Museum. By W. LAURENCE HENRY DUCKWORTH, B.A. - - - - - - - - - - - - - 284

On an unusual form of Rush Basket from the Northern Territory of South Australia. By R. ETHERIDGE, Jun. (With Plate XVII) - - - - - - - - - 315

On a Modification of the Australian Aboriginal Weapon, termed the Leonile, Langeel, Bendi, or Buccan, &c. By R. ETHERIDGE, Jun. - - - - - 317

An Australian Aboriginal Musical Instrument. By R. ETHERIDGE, Jun. - - - - - - - - - - 320

The Aborigines of North-West Australia. By P. W. BASSETT-SMITH, Surgeon R.N. (With Plates XVIII and XIX) - - - - - - - - - - - - - 324

Japanese Onomatopes and the Origin of Language. By W. G. ASTON, C.M.G. - - - - - - - - 332